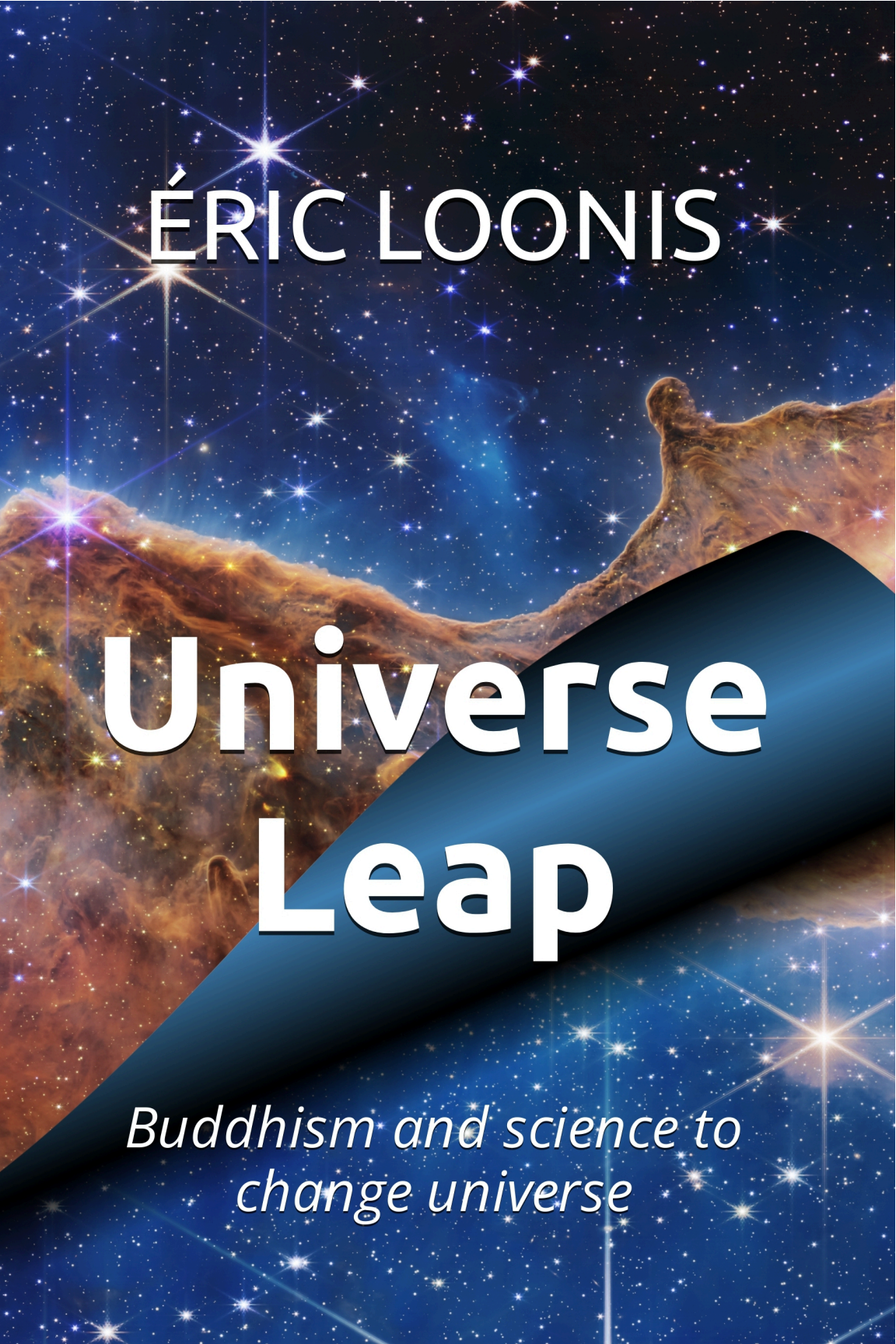
ÉRIC LOONIS
Universe Leap
Buddhism and science to change universe

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ÉRIC LOONIS

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Other works by the author

"Spirituality-fiction" is a text that speaks in various ways of spirituality, but which does not take itself seriously. For this, spirituality is mixed in one way or another with science and leads to some practical method, a little "magical," which can eventually give concrete results, provided you believe in it! The whole art of spirituality-fiction is to give itself verisimilitude, even plausibility, by cleverly mixing the authentic spiritual and the most rational science, while adding a little zest of fantasy, magic, dream and hope that dwells in every human.

PREFACE

From immemorial time, men have sought to realize their dreams and their desires by appealing to intercessory spirits or gods, or even by devoting themselves to magic, to prayer, waiting for improbable miracles. Psychoanalysts tell us that this "magical" mentality goes back to the first months of our life, when we were still an infant, helpless to transform his world and who believed, following the fortuitous coincidence between an eye blink and the agitation of a rattle, that there was a "magical" causality between the one and the other. The very young child believes that his cries "magically" bring him his mother's milk, still unaware that his mother is an autonomous person who gives him her milk on the basis of her own motivations.

But although many of us, as adults, behave almost like dissatisfied infants, the persistence of the magical mentality in men cannot be explained solely by the persistence of "childishness." One cannot believe in such immaturity in so many people, one cannot suggest that are "childish" all these scholars, these researchers who, beyond their rational science, feel drawn towards the "supernatural" (sometimes naively succumbing to the illusions of charlatans). And if we cannot believe in such a weakness in our fellow human beings (and for ourselves), it is because this magical mentality must represent something real, a characteristic of the world. There would be in the universe a "magical" quality

that we do not master, but that we inexorably sense and towards which we feel inspired. This intuitive, obscure, knowledge of the "magic" of the world, then reveals itself in our clumsy attempts to implement it.

This book is the fruit of a discovery and an experience. Discovery of false and true laws on the "magic" of the world and experience of the application of these true laws, resulting from modern quantum physics. Having thus discovered these laws and having applied them for ourselves, out of love for our fellow human beings, we had to share this knowledge and this experience, so that every man could, too, increase his powers of "magical realization," obtaining the answer to his prayers, accessing miracles, realizing his dreams, finally being fully a human.

That said, if the "magic" of the world were as easily accessible as this preface seems to lead you to believe, everyone would have noticed. On the contrary, the implementation of true "magical" laws requires the application of a new mentality, of specific rules, which join the highest spiritual teachings. This book will reveal a big secret to you: in a way, "magic" as we usually understand it does not exist. It is not possible. On the other hand, what is possible, what we are going to teach you to do is to "change universe." And it is by means of universe changes, among the infinity of parallel universes, that you will be able to realize some of your desires because, what does not work in one version of the universe, could well work in another.

This book is therefore also a tool, first of understanding, and then of encouragement. Wanting to change universe implies to better apprehend what is the Ultimate Reality and its informational substrate. You are going to arrive at the exact conception of what the universe, the universes are. You will no longer see things as you see them today.

The only way to produce the quantum leap into another universe is, first, to reach the *Ish* level of consciousness. That

is to say the inner detachment from this universe, the one in which you currently live. A detachment, a distancing, which are not easy to achieve. However, this new comprehension of the informational universe, of the universe as information, such as it will be brought to you by this present work, will help you to take this interior distance.

The informational approach of the universe, of the multiverse, is a valuable aid to fully understand the practice of meditation and its possible effects. The leap from one universe to another, parallel or different, is not in itself an extraordinary thing. It is no stranger than changing channels on your TV, simply by pressing a button on the remote control. The first channel is information. The second too. You have only passed from one piece of information to another. When you have understood to what extent the universe in which you live is also information, you will understand how easy it is to pass into another informational universe.

Éric Loonis

INTRODUCTION TO THE UNIVERSE LEAP

This book is based on great metaphysical texts from Mādhyamaka Buddhism[1], which we have tried to bring into line with modern and scientific theories of quantum mechanics, the two schools of thought illuminating each other in order to produce this superior understanding, this "vision" of the universe, of universes, which will give you the key to change. The marriage between these two jewels of human thought forms an **informational "ontonomic " model of the multiverse**: the metaphysical approach of Being, of Onton[2], finds here an equivalence with the quantum of information, such as it is designed in the informational theory of the universe.

For people who have no particular knowledge of quantum physics, this book is undoubtedly intellectually demanding. However, you will not find there, rest assured, any mathematical formula. Everything is explained as simply as possible, with many illustrations and metaphors that will allow you to visualize and understand, more or less intuitively, the difficult concepts of quantum mechanics, as well as those of Buddhist metaphysics.

You will also discover a more advanced technique, capable of combining both your will to change and the neutrality necessary for such a change. Thus, this new conception of the multiverse, as an informational ontonomic hypermatrix, combined with the practice of an effective technique of

mental neutralization, will give you, I wish you, every chance of … changing universe!

The parallel universes

The first impulse, when one wishes to realize a wish, a desire, is to want to change one's world, to see things being transformed in our universe. This is indeed the first and most fundamental error in the matter of "magic."

This is a mistake, because we are caught, as if stuck, in a universe of causes and effects so dense, at the heart of so many phenomena of action and reaction, that it is pointless to try to modify the course of things. To take an image, we are like a bee stuck in a pot of molasses and struggling; or again, like a bacterium in the middle of the ocean, assailed from all sides by the agitation of water molecules and which wonders how to modify its situation. Of course, we can act on our universe and this is what we do every day; but it is at the cost of intense activity and innumerable efforts. Whoever wants a car must buy it, therefore earn money, therefore work. To modify the world around us, we are forced to move to the rhythm of the world, forced to perform a whole host of physical, motor and linguistic actions. We have to move, move things, speak and convince, seduce. The idea of a magical action on such a universe of confused causes is strictly unrealistic, because even in terms of occult influences the forces involved are far too great. Billions of wills constantly clash in the ether and the overall result of all these clashes is an immobility, an enormous resistance of things. We need look no further for the reason for the constant failure (or rarity of success) of acts of magic, of prayer: action, change in our universe is practically impossible and when possible, it is either at the cost of a considerable expenditure of energy (which in turn annihilates the pleasure at which one has arrived), or by obscure conjunctions of causes which make the process of transformation practically uncontrollable. What we've

discovered is that while we cannot practically change our universe… we can **change universe!**

As with magic, the design of parallel universes goes back a long way in human knowledge. Men have always felt intuitively that there are other universes, other worlds than the world of everyday life. They described these parallel worlds like the abode of spirits, of gods, which one touches in dreams (or with the help of drugs and trances), or even like the world of the dead. They imagined paradise, hell, infernal universes where the wicked would be punished, marvelous ones where the righteous would be rewarded. Universes "beyond" where we could find those we love, where all our desires would be satisfied, where we would be fully happy.

To these poetic and childish visions must be added the more philosophical conceptions of parallel universes. Of all time philosophers devised theories regarding parallel universes. Many science fiction writers have exploited this imaginary vein of universes shifted in time or space, in other "dimensions." Finally, modern science itself comes to bring grist to the mill of parallel universes. Alongside the classical *Big Bang* theory, there are no less serious theories concerning a multiplicity of *Big Bangs*. Even "UFO" type phenomena do not escape this conception of a multiverse and faced with the difficulties posed by intergalactic travel, due to the immeasurable distances and the limits of the speed of light, many ufologists think of travel between parallel universes.

The most obvious theory of parallel universes is that which could be called *omnipossibility* (G. W. Leibniz): since nothing comes to limit the possibility of things, it is logical to think that everything is possible and that there would therefore exist a multiplicity of universes, one for each possible. These universes would coexist in parallel space-times and it would therefore become possible to "travel" from one universe to another and thus discover other causal chains. For example, if in this universe you are married to a

cantankerous woman and own a red car, in another universe, causally very close and parallel to this one, you might have married a nicer woman, or you might not have not married at all and owning a blue car. In fact, at every moment, different universes would form according to all the various causal and logical possibilities: there is a universe where you turn the page of this book and another where you close the book, another where you read a completely different book, and so on…

If we consider things at the level of the fundamental particles that make up matter, the model of a multiplicity of parallel universes means that a particle going from point *A* to point *B* will not go through a single path, but through a variety of paths. Or that a particle, or an atom, may have several different states at the same time. Current research at the level of quantum physics confirms us in the idea that particles, or waves, can be found at the same time in two different states at the same time.

Recently, Schrödinger's cat paradox has just found its solution. In this imaginary experiment, the life of a cat is held in the quantum state of an atom. Suppose a cat is placed in a cage with a device capable of sending it a fatal electric shock, a device triggered by an electrical relay.

Now, this relay is connected to an electronic circuit which triggers it, this electronic circuit being controlled by a detector capable of detecting the quantum state of an atom which could be called "yes" and "no." As naturally this atom is both, at the same time, in the quantum states "yes" and "no," consequently the cat is both electrocuted and not electrocuted, both dead and alive. As such contradictory phenomena are never observed in nature (a cat is always either alive or dead, not both at the same time), the scientists found themselves in front of a beautiful paradox, because at the same time, quantum physics confirms well the superposition of two or more quantum states for the same

particle. For example, in the so-called Young's double-slit experiment, photons are passed through fine slits (but the same result is produced with electrons, neutrons or atoms), on the screen placed at the exit of the slits we observe interference fringes which mean that the photons must have behaved like a superposition of two waves. In other words, it is as if each photon had passed through two slits at the same time!

Current experiments lift the veil on these paradoxes of the transitions between classical mechanics and quantum mechanics. On the quantum side, we know that a particle, an atom, in a word any system, if it has several possible distinct states, can be in all these states at the same time, as if several realities were superimposed. However, if this principle of the superposition of states is well verified at the level of microscopic experiments, in our everyday macroscopic world we do not usually observe such superpositions of states. A mouse never passes through two holes at the same time, a door is never open and closed at the same time... However, mice and doors (and ourselves and our whole universe) are made up of atoms and of fundamental particles which exist permanently in the form of quantum superpositions of different states. So how does this transition between quantum and classical mechanics take place?

When we seek to detect this passage from quantum to classical (for example, a macroscopic device of the detector type with a dial and a needle which indicates whether an atom is in a state *A* or *B* according to its energy level), of course, the needle is never seen both to the right and to the left of the dial. Simply, if we repeat the measurement several times, we observe that the needle is statistically placed in 50% of cases on the left or on the right. Thus, the superimposed quantum states undergo a phenomenon of *reduction* to a probable random state. This reduction means that the transition to macroscopic measurement hides the phenomenon at its quantum level: which is a superposition

of different and indeterminate at the quantum microscopic level, becomes a differentiated and determined state at the macroscopic level of classical mechanics. Why is there such a transition?

The answer that physicists bring to this problem is as follows: it is the interactions of all the particles between them (that is to say the environment of the particle that we observe) which causes a quantum "decoherence." If we repeat Young's double-slit experiment with atoms and "illuminate" the atoms to find out which slit they pass through, the effect of the interference fringes immediately disappears: the information produced by the lighting (which amounts to bombarding the atoms with light photons) produces a decoherence and suppresses the quantum coherence effect which allowed an atom to pass through two slits at the same time. Other experiments showed that the loss of quantum coherence took a certain time, a shorter and shorter time depending on the number of atoms, of molecules present.

All of these researches leads many researchers physicists to design, too, parallel universes. In quantum level, a particle does not belong to any universe, if not to all! It is everywhere at once and possesses all possible states. It is by a phenomenon of multiple decoherence that the particle will find itself here and in this state, that is to say in such a universe.

What we must understand now is that the universe which is ours is made up of a certain number of fundamental particles which are all, at the base, in a state of quantum coherence. It is because at a given moment there is decoherence of particles at the quantum level that the universe is created, in the sense that it is determined in a precise spatio-temporal form. This form cannot be unique because decoherence can occur towards any possible state and we thus agree with the reflections of philosophers who consider that the freedom of possibilities implies the

simultaneous and parallel presence of a multitude of universes.

From there, we can clearly see that at the macroscopic level the actions of change, of transformation are limited by decoherence: the universe is as it is and we are subject to the macroscopic laws of causes and effects which bind us and limit the possible ones. On the other hand, at the quantum level, when all the universes are potentially confused in coherence, everything becomes possible and each possible corresponds well to the shift in a particular universe. Also, the real "magical" action does not relate to the universe in which we are, but consists of our passage from one parallel universe to another. The question that now arises is how to create the conditions for the transition from one universe to another?

From chance to Chance

Our possible passage to another universe, a universe parallel to the one that currently welcomes us, requires a good understanding of the question of causality and chance.

Chance, in a first approach, corresponds to events that occur unexpectedly and inexplicably. It is unexpectedly and inexplicably that a tossed coin will land on heads or tails. At most, we can oppose probability to chance: here our piece will have a one in two chance (because in this case there is no only two possible) to land on heads or tails. Similarly, the scientific theory of the evolution of living beings is based on the idea of random chromosomal mutations. It is therefore, by chance, that intelligence and consciousness developed in primate mammals, up to man. Chance could no doubt have produced the same thing in a bipedal reptile whose brain would have developed sufficiently… If chance thus conceived is unforeseen and inexplicable, this does not mean a total absence of causes. Simply, the causes are either imperceptible or so numerous that we cannot perceive them with sufficient precision, so that what we call "chance" is the

epitome of our ignorance. For the scientist, there is never chance, but imperceptible causes which give the impression of chance.

If we could, as soon as the coin is thrown, identify all the parameters that will guide its trajectory and its own movements (initial impulse and orientation, air movements, etc.), then we could predict on which side the coin will fall , as surely as we predict the opening of a door when we turn the key in its lock.

Thus, everything is chance when we ignore the causes (causes that always exist), but nothing is chance, finally, if we consider that everything has its cause. However, the true Chance exists however, the one that we will write with a capital "C." This Chance concerns the quantum states of which we spoke above. Here, as we are dealing with elementary states of fundamental particles, there is no cause and the switch from one state to another is indeed a matter of true Chance.

This Chance of course clashes with the truly fundamental character of a particle, therefore with the truly elementary character of a state. It is clear that if a particle turns out to be composed of more elementary sub-particles, its states will depend on the causes produced by these sub-particles and not on a real Chance. But if we now consider these sub-particles, then they themselves will not depend on any cause and will be, in their different states and movements, the fruit of Chance. If we consider that the universe is decomposing into an infinite regression of increasingly "elementary" particles, then Chance will flee that we never reach it. However, it seems, in the current state of knowledge in particle physics, that there are many fundamental states, called quantum states, of matter-energy, so there is indeed a real Chance at this level.

Thus, the only true Chance is at the level of quantum states. Beyond the quantum states (i.e. the only states that

appear in an unpredictable and inexplicable way), everything is determined, there is no longer Chance, but a simple chance (with a lowercase "h," fruit of our ignorance of the causes). From the shifts, at random, towards the different quantum states of all the elementary particles, a multiplicity of universes is formed which necessarily coexist in parallel spatio-temporal states. Hence the idea of a kind of cloud of universes and we are in one of these universes in an infinite cloud of universes.

If we come back for a moment to our "Schrödinger's cat," to say that he is both dead and alive means finally that he has split into two parallel universes: one where it is alive, the other where it is dead! Thus, each time a change of quantum state occurs, the world doubles. Universes are constantly being created where events diverge from one another, from one quantum state to another[3]. According to the most recent theoretical models, all these universes in infinite number coexist in a pure quantum state in which all the states of all the particles in an entangled fashion. All possible worlds coexist in the same supra-quantum place, using the same matter-energy, but according to infinitely different combinations of states, determining spatio-temporal frameworks both entangled and isolated from each other.

To understand this situation, we can take as a metaphor these boards used by ophthalmologists to identify color detection disorders. There are rounds of different colors and sizes. These points are all mixed up, entangled, but our brain, by selecting the colors (therefore distinguishing them), manages to recognize, for example, the letters "A" and "S." In the same way, we belong to a universe and perceive this universe, although we are immersed at the same time in an infinity of universes.

We said above that in this universe that we perceive and in which we are, it is particularly difficult to change the course of events. We must make special efforts, more or less

important, or wait for improbable changes due to chance (or Chance!). However, all around us, intertwined with us and with our universe, coexist an infinity of universes where the things which happen to us, if they can be worse, can also be more favorable. Here we are again, but this time with better assets, faced with the question of the universe change: how to pass from one universe to another?

From brain to consciousness

Men have always used their consciousness to try to modify the world in their favor and this, we said, is a clue, a sign that something is concerned with consciousness, thought, to change the course of events. But now that we know that action in our universe, especially by the thought, is not possible, our question becomes: is it possible, by an action of consciousness, to change universe? Now, this question refers first of all to that of the nature of consciousness.

Current scientific (and materialistic) theories regarding consciousness see it as a product of our brain. In other words, all our contents of consciousness (ideas, feelings, emotions, memories, feelings of being oneself, of being free, dreams and fantasies…) all of these represent the result of the actions performed by the assembly of nerve cells, neurons, in our brain. Our conscious experiences are emergences from the brain system, so-called "emergent" properties. An emergent property of a system is a property which is explained by the action of the parts of this system, but which does not belong to any of the parts of this system, nor can it be explained as the simple sum of the parts of the system. It is something more that goes beyond and emerges from the sum of the parts of the system. For example: at room temperature and pressure, separate hydrogen and oxygen molecules never exist in liquid form. On the other hand, it is their association in the compound molecule H_2O which produces water and its liquidity. It is from the organized association of all parts of

the brain (molecules, neurotransmitters, synapses, neurons) that consciousness emerges.

We can currently describe the functioning of the brain in broad outline. It is an organized assembly of a few hundred billion nerve cells, the neurons. These neurons are closed cells, ie not directly connected to each other, but which can communicate with each other through biochemical and electrical signals. The circulation of signals (nerve impulses and action potentials) is done by extensions of neurons (dendrites and axons) and their transmission from one neuron to another passes through synapses (or synaptic buttons). Synapses are specific places where neurons come into contact with each other through special chemical molecules: neurotransmitters (or neuromodulators for those that have a more specific regulatory function).

All in all, our neurons operate using bioelectrical discharges, action potentials, which are all of the same amplitude. The signal is therefore produced, not by a variation of the amplitude, but by a frequency modulation, just like for the FM of our radio sets.

On the other hand, our neurons are organized into modules and integrated systems that each manage particular characteristics of the signal. For example, there are systems for vision, hearing, movement, etc.

Other finer modules, for example, in the vision system, can manage only particular qualities of the visual message: color, shape, vertical, horizontal, oblique lines, etc.

Ultimately, it is this set of biological mechanisms, in our head, that produces our consciousness. Of course, this kind of disproportion between our consciousness which seems infinitely complex and vast to us (think of the multitude of memories of a human being, adding to it all his possibilities of imaginary creation) and the narrowness of the brain, a biological organ of one thousand four hundred cubic centimeters enclosed in the cranial box, renders, as one

author (F. Crick) has called it, truly *astounding* the hypothesis of a link between brain and consciousness.

Many theories and speculations are currently trying to account for the links between brain and consciousness. Several cerebral properties are used, such as categorization, memory, learning, the distinction between self and non-self, temporalization, functioning in parallel and in loops in the processing of information, etc. All these qualities, this specification of a conscious brain, only account for the links between brain and consciousness, but cannot in any way provide an explanation of consciousness.

Some approaches are more interesting because they seek to get to the heart of the finest mechanisms of the brain to bring quantum phenomena into play. To do this, it is necessary to go further than neurons, synapses and molecules and to take into account what is happening at the level of ultra-fine structures such as the microtubules of the cytoskeleton of neurons (Penrose-Hameroff's model). Inside all neurons are a very large number of microtubules, kinds of small tubes that serve to maintain the architecture of the neuron (like a skeleton), but also for molecular development. It is in these microtubules that quantum phenomena could explain consciousness. Other authors put forward other very fine mechanisms, again at the quantum level, which this time would take place in the synaptic buttons, for the release of mediating substances of the signals between neurons.

A beginning of explanation seems to appear well when one observes how the modification of the states of consciousness causes modifications of the functioning of the brain. However, if we see here a very enriching deepening in the knowledge of the reciprocal links between brain and consciousness, we still do not know, at the base, how all this can work well.

All these theories have the serious defect of being materialistic and realistic and of following the

presupposition of a world (containing the universe of bodies and brains) outside consciousness. This presupposition (most often unconscious) once posed, the problem is to connect and explain this link between world-body-brain and consciousness. However, the presupposition is basically completely false and stems from a distorted philosophical vision. It is embarrassing to have to expose these ideas which were already formulated twenty-five centuries ago by the Buddha, then taken up more recently by some of our existentialists in the West (E. Husserl). But apparently there are truths that have trouble settling, precisely, in the brains!

It all starts with what is called in philosophy the transcendental *epoché*. Under this mysterious name hides a simple approach in principle, perhaps less simple to understand and carry out. It is about starting from a philosophical *tabula rasa*, a clean slate which consists in rejecting all beliefs, ideas and theories to focus only on what is. What is, are the phenomena about the world and those about our intimate thought. The latter, without problem, can be attached to our consciousness. On the other hand, with regard to the phenomena of the world, a work of phenomenological reduction is necessary. This work will consist of considering each sensory and perceptual category and asking ourselves where these categories exist. Whether we consider the vision, the hearing, what we smell, touch, all our sensations and even our proprioceptive sensations, of our own body, all of this exists **only** in our consciousness. Finally, everything exists **only** in our own consciousness and we cannot in any way see, hear, smell, touch or even imagine something that would be outside our consciousness, since from the moment this thing is seen, heard, or touch, etc. it would be so precisely *in* our consciousness.

Usually, people try to get out of what they consider to be a problem: *the problem that everything only exists in my consciousness*, by arguing like this: “So be it! The world only exists in my consciousness, but there are *other* humans who

speak to me and talk to me about an identical world that exists in their consciousness, so there really is an outside world to our consciousnesses to all of us." This realistic reasoning cannot hold water if one considers exactly how and where these famous "others" actually exist. Like everything in the universe, other people only exist through our sensations of them: we see them, hear them speak, smell a woman's perfume, feel the touch of a clenched hand, but ultimately all these sensations exist only in our own consciousness. Also, the argument of the others does not have any value, one cannot demonstrate the existence of the world external to the consciousness (ours) starting from testimonies which never exceed the level of our consciousness. We are like in a dream, with a universe, our body in this universe and the bodies, the presence of others, like so many dream characters, but everything is only a kind of dream in consciousness.

This situation is called in philosophy (metaphysics) "solipsism" (which means in Latin "I am alone," *soles ipse*). Solipsism is particularly uncomfortable and agonizing, because indeed one feels quite alone with one's own consciousness and one realizes that one cannot get out of it, at any time, because in any way one "gets out of it," where then will this "exit" from consciousness take its existence… if not in our own consciousness, of course.

However, if we cannot get out of solipsism, we can make it a little less worrying by considering more exactly its characteristics. For this we are going to take what is called the oneiric metaphor, that is to say consider by analogy the situation of the dreamer who is in his bed and who, while sleeping, dreams that he is in a world, with characters and that he himself is one of the characters in the world. Imagine then that in his dream the dreamer begins to realize a transcendental *epoché*, a phenomenological reduction to solipsism. He then tells himself that he is the only consciousness in the universe and that everything only exists

in his consciousness. Now, saying this, he becomes aware that he is in a dream and doing so he understands that this awareness is not that of himself as a character in his dream, but that of himself as a dreamer. All this universe, the events, the characters and himself, ultimately only exist in the consciousness of the dreamer, the one who is in his bed.

If we transpose this into the situation of our consciousness of the world, this solipsism at which we had arrived does not mean that the only consciousness of the universe is that of ourselves, but it is the consciousness of a kind of "dreamer" that transcends this dream world. Here we have arrived at the transcendental ego, which corresponds to a transcendental solipsism, a little less simplistic than the first solipsism, that of mister Smith. But the philosophical analysis does not stop there.

Indeed, this famous dreamer of the world can be brought himself to carry out a phenomenological reduction. Somehow he wakes up, finds himself in his dream world (which is transcendent to the dreamed universe) and realizes that he himself is "dreamed" by a transcendental ego who is superior to him (in terms of transcendence). We then find ourselves faced with an infinite regression, from transcendence to transcendence, each new transcendental ego being "dreamed" by an even more transcendental transcendental ego and so on, without end…

All this philosophical work leads to strange results. First of all, although everything that exists, exists only in a consciousness that conceives it, at no time have we been able to demonstrate that something could not exist outside of all consciousness, in itself. On the other hand, this fitting of transcendental consciousnesses into each other does not define a personal consciousness, but a sort of diffuse, general, universal consciousness. The synthesis of these two results is that the phenomena of the universe, matter-energy in all its forms and consciousness realize a unique, inseparable whole:

the only thing that exists is a diffuse and phenomenal consciousness encompassing the All.

From this analysis, the relationship between brain and consciousness is completely reversed. We were, at the start, faced with the question of the explanatory links between brain and consciousness according to the point of view of a brain that makes, produces consciousness. To present, we are much more on the point of view of a consciousness which produces a brain, in a body, in a universe, populated by other bodies who only testify, by their behavior, to a consciousness which would be own.

Also, the links between consciousness and the brain are no longer posed in the same way. There is no longer any necessary explanatory link between brain and consciousness insofar as the two seem indeed inseparably linked in an ontological unity (that is to say of being). What we can now understand, on the other hand, is that this brain-consciousness synthesis, which is only a particular case of the more global universe-consciousness synthesis, or even energy-matter-consciousness, that this synthesis is inscribed on a continuum that starts from a universal, diffuse, impersonal consciousness, whose counterpart is a shapeless plasma energy-matter that corresponds to the first moments of the *Big Bang*. Thereafter, at the same time as the consciousness becomes more complex, unfolds, the energy-matter develops in atoms, in molecules, in biological, then cerebral events, those of a world inhabited by conscious beings, precisely.

If we now return to the speculations of neurobiologists about quantum states in the brain to explain consciousness, we can more clearly explain this matter-energy-consciousness continuum. At the level of consciousness, which we will call quantum, we have a very diffuse consciousness for which all the quantum states are superimposed, entangled (it is quantum coherence), all the

potential universes are there, totally mixed. Then, the very first determination of consciousness, which we will call primordial consciousness (which Buddhists call *Ish* – from *Ishvara*, which can be translated as cosmic consciousness according to Hindu or Buddhist traditions), will consist of a quantum decoherence which will to switch the indeterminacy of all the states towards such and such a state.

It is at this level that the parallel universes are created and that a diffuse and still global consciousness attaches to each of these universes in infinite number. Thereafter, the *Ish* consciousness will develop and differentiate more and more according to the five famous Buddhist *skandhas*: first the form, then the sensation-perception, the reactivity, the concepts and finally the fully elaborated consciousness of the ego as that it appears in human consciousness. At this point, the consciousness has become very complex, it is centered, reflective, embodied in an ego, a personality and a body, all charged with materialistic beliefs in a brain which would be the source of it, the beautiful illusion!

Universe leap with the *Ish*

Logically, it is now easy to understand two essential things: on the one hand, at the level of the consciousness developed and incarnated in a universe, it is easy to realize that all transformations on this universe will require a very great energy, innumerable efforts for poor results that will, in any case, be constantly questioned; on the other hand, if one manages to descend to the level of *Ish* consciousness, then it becomes very easy, not to change the universe, but to *change universe*, that is to say to pass over a parallel universe slightly shifted, this shift corresponding to the changes that we expect. These two points have two implications for the method to be used to change universe: firstly, since practically nothing can be changed at the level of the universe itself and, on the contrary, the energy and the efforts deployed to try to produce an intra-universe change

hinder the possibilities of inter-universe leap, it is necessary to enter into an attitude of detachment as complete as possible in relation to our current universe; secondly, the only way to be able to change universe is to reach the *Ish* consciousness in order to operate a simple shift, change of quantum state.

We can understand all this using the metaphor of the lever. If you want to lift a five hundred kilogram stone, you just need a fairly long lever and a point of support. The shorter the lever and therefore the closer we will be to the stone and the more difficult it will be to lift it, the more effort we will have to make. To fifty centimeters from the stone, the lever will be too short and we will not be able to move it. At one meter, she will probably move a little, with a lot of effort and energy deployed. But the further we move away from the stone by extending the lever arm, the easier it will be to lift it with the slightest effort. On a quantum level, switching to the *Ish* consciousness level requires no effort, it is just a flick, an eyelid flutter.

When we reach *Ish* consciousness, all possibilities are open to us. We find ourselves at a kind of immense crossroads from which all the possible universes would start and we only have to take one step, a very small step, to switch to such and such a universe. The problem that arises now is twofold: how to achieve *Ish* consciousness and how to choose the right shift?

The attitude of detachment from the world is essential if one is to attain *Ish* consciousness. This attitude is moreover recommended by all the great spiritual teachings. The myth of the salt statues represents the parable of the same prescription. The hero must cross a plain without looking back, despite the cries and complaints he hears behind him from the one he loves. Because if he turned around, then she would turn into a salt statue. He must resist the temptation to remain attached to the world, to cross the plain without

failing and this is how the hero obtains his reward. He must first give up what he wants to get, in order to get it. Elsewhere, one must dare to embrace the toad, the monster, the beast, to obtain the prince or the desired princess. These children's stories contain, in a thinly veiled way, the same deep truth of detachment that the spiritual teachings explicitly articulate. If one has a desire, if one wants to obtain something, one must first give it up, detach oneself from it, this is the first step to reach *Ish* consciousness, to create *Ish* harmony within oneself . Why is this detachment necessary?

The desire and the will to have, to seize, to monopolize, are the expressions of the highest and most complex consciousness. They are the perfect expression of this well-differentiated consciousness which exists through its lacks and its frustrations, in a developed universe, filled with shimmering and fascinating phenomena. When one maintains oneself thus at the level of desire, one is as if chained to the developed, phenomenal consciousness, one is in the situation where one must make great efforts to change something in the world, to obtain what the we want by transforming the world. This will is crazy, like the will of someone who wants to lift a mountain. Of course, from time to time you can get a few small things and with a bit of luck, sometimes a big thing; but these satisfactions never last very long, because the universe has been forced, which does not take long, like the water of the river diverted for a moment by the rock, to resume its normal course. The phenomenal consciousness, immersed in the heart of a complex universe is the first barrier to reach the *Ish* consciousness.

The attentive reader will think that there is a contradiction between this detachment from what one desires and the will to obtain this thing through the *Ish* consciousness. The contradiction is only apparent and stems from this distorted vision of a certain spirituality centered on the idea of asceticism, inner combat and passivity. In fact, this distorted version of spirituality that takes itself too

seriously represents a kind of *spiritual materialism* (C. Trungpa), a distortion of true spirituality. In a famous text of Indian antiquity, the *Bhagavad Gîtâ*, we witness the edifying dialogue of a warrior lord who, under the pretext of not doing evil, does not want to fight a battle during which he will be led to kill people (who are more of his family) and God who shows him the inconsistency of such a conception. Because not to fight against those who want to fight is to remain in confusion and the beliefs of a universe of phenomena and it is to ignore the eternal souls that no sword can touch. But moreover, declares the Divinity to him, since you are in this world, which demands your action, **you must act while renouncing the fruits of the action**. He who acts desiring the fruits of the beyond, the future reward of his passivity and his asceticism, he is in the greatest error. It is the same error, but related to the spiritual plane, as the one who is agitated in the world to obtain its fruits. True wisdom is to do what you must do, without allowing yourself any attachment to the fruits of action, whether those fruits are good or bad.

So, as we now understand, there is no contradiction between desire and detachment. Desire and action are both in the order of the phenomenal universe and they find their necessity there, we cannot escape it and wanting to escape it creates other desires and other actions which bind us. Also, it is a question of doing what must be done, but in detachment from the results of desire and action. We can understand today how the expectation of the results of the action binds us in the developed and phenomenal consciousness and blocks us from being able to reach the *Ish* consciousness. So, we repeat, the only way to get something is to give it up, since in any case the desired thing cannot be gotten in this universe, but must be attained by changing universes and changing universe is already renouncing the present universe.

In other words, the thing that you desire, and that you see in this universe, is not the thing that you have to achieve.

You must give it up, no longer consider it desirable in itself, but direct your desire towards this same thing in another, parallel universe, which you can reach through the *Ish*. And to say "that you can reach" is still a mistake. You will change universe and you will not even have to "reach" the thing, because in this new universe it will be given to you automatically, since you will have chosen the parallel universe where the thing naturally fell to you. Finally, this is what all religious believers aim for in a paradise in the afterlife, after death: to detach themselves from the desires of this world to satisfy them in another world after death. Except, for us, with the *Ish*, this idea of dying to change universe is quite ridiculous. With access to *Ish* consciousness, we can change universe in our lifetime!

Of course, this *Ish* harmony cannot relate only to the thing one desires, but it must relate to all things. The goal is to change universe and we cannot change universe if we remain attached to this present universe. If one wants "A," it is not enough to renounce "A" in this universe, one must also renounce "B," "C"…, this whole universe.

This renunciation, this sort of passivity does not mean that one becomes amorphous and really passive, because that is another illusion, because such a forced passivity is very active. We quickly realize that we have to make efforts to give up and be passive and these efforts attach us to the universe as well as the efforts to satisfy our desires. In a way, we find ourselves attached to an ascetic universe, a universe of renunciations! It is undoubtedly the worst of attachments, because it is more blinded by the belief in our detachment. True detachment, renunciation, consists in accomplishing all the actions that this universe demands of us, but without ever being attached to the fruits of the action. We do not expect anything from the actions, but we carry out the actions. True detachment is more subtle and intelligent than the gross and illusory detachment of the ascetic. The ascetic takes the world just as seriously as the enjoyer, because both

are in the effort. **The secret, ultimately, is non-effort**. If you act effortlessly, that is, without the passion of greed, just because you have to act, then you will be detached. This universe is like an impetuous torrent carrying innumerable forces and desires. He who runs after his desires is like the man who would like to catch the eddies, the whirlpools of the torrent; he who renounces action is like the man who would like to struggle against the current of the torrent. But he who truly renounces is like the man who allows himself to be carried, without struggle and without effort, by the torrent: the eddies and whirlwinds are the motives of his action, simply because they are there, but he does not struggle against them nor seeks to seize them.

Detachment from the fruits of action is the first step on the way to attaining *Ish* consciousness. This first stage is intended to create a general state of mind of detachment conducive to the second stage. This will consist in directly reaching the *Ish* consciousness. It involves the practice of meditation in order to create the conditions for the third stage, that of the emission of *Ish*. There again, nothing new on the face of the world and the techniques of prayer or meditation have been known for centuries, simply, many of these techniques and practices are marred by errors and misunderstanding. The most serious error is that of prayer as the action of asking something from a superior entity. For the prayer thus formulated implies the maintenance of the belief in the ego embodied in a universe, this universe. Even if one takes the first step of renouncing action to ask the deity, one does not renounce the fruits of action. Even if one asks in prayer for others, one does not for all that renounce this universe and the illusion persists.

The path of meditation, if it is based on non-effort, is much more stripped down and pure and it is this which can create the special conditions of *Ish*. The reader will find many books where it will be explained to him in great detail how to

practice meditation, so we will content ourselves here with laying the foundations of the practice.

The context first. In principle, since the object of meditation is a detachment from the world, from the context, the latter matters little. But, it is true that, for beginners especially, it is preferable to choose a conducive to meditation context: a calm and solitary place, perhaps close to nature, because far from the objects of human desires.

Posture is also important. It is a question of finding an immobility of the body, but without falling into drowsiness. So the seated posture is the most practical. Whether you are seated in a Lotus or a half Lotus, or on a chair does not matter, the main thing is to have your spine straight (even if it means supporting it against a wall at first, with a cushion in the small of the back), your chin slightly back, head straight. This posture is intended to regulate all the energies of the body in order to be able to detach from it. We let the shoulders fall naturally, rest the hands on the thighs or on the feet depending on the posture. We can close our eyes, or keep them open, or half-open, facing the horizon, or facing a white, neutral wall. And there, in peace and silence, it is a question of doing nothing…

Of course, as doing nothing is the easiest thing to say, but also the most difficult to "do," as one cannot manage to do nothing at the beginning, then the technique dictates that one should only do at beginning "almost nothing." This almost nothing is to repeat in mind always the same little thing: a word with no particular meaning, a sound, fixing one's attention on a color, an object, on breathing. This last technique is undoubtedly the simplest and the purest and that is why it is the most taught: to be simply aware of the breath which enters and leaves and when you realize that you are not more aware of the breath, then come back, **effortlessly and without concentration**, to the breath coming in and going out.

This is the technique at the start. Over the course of the (daily) practices, a mental condensation will be created, which is not a concentration. This condensation is like the vapor which condenses on the cold glass: you created the cold glass and naturally, without effort, the thoughts came to condense in drops on this glass. It is a mistake to practice meditation with effort, concentration and pursuit of goals. Meditation is non-effort and one uses the technique initially as a crutch that will be discarded later.

The daily practice of meditation (between twenty minutes and half an hour at least) for months and years is intended to create harmony and *Ish* consciousness, but many barriers will have to be overcome before this consciousness can be achieved. It is a question of descending through the five skandhas and sinking into the ocean of the spirit using the submarine of the technique. First to leave the restless waves of the surface, all thoughts and concepts, theories and fantasies, to descend a little below the surface. Then, we will go further than the emotions, the reactions, the fascinations to reach the sensations. Having reached this stage, one is as if comfortably installed in one's sensory body and it is then a question of relaxing more. But before that we will have to cross the physical and mental barriers. Physical barriers, of the body, can present themselves as tensions, aches, pains, nervousness, tingling, skin irritations, etc. It is advisable not to panic nor to not get irritated more on these impediments, which would only maintain them.

Just move a little, move a limb, stretch, even get up a little and walk for a while, then sit down and resume meditation. These physical inconveniences should fade over the course of daily practice, in a few months. Other more subtle barriers may appear, such as strange sensations, the impression of leaving the body, or that the body is twisted, strong feelings of hunger, thirst, or sudden sexual arousal.

All this is very normal, it is the tensions of the body which are in the process of being put back in place and released. Once again, do not struggle, even if it means stopping meditation for this day and resuming the next day. If the disorders persist, or are too important, it will be necessary to consider receiving a teaching in body yoga in order to help the practice of meditation.

The mental barriers will present themselves as a flood of disjointed or fascinating thoughts, like a gripping film to which the mind will hang for long minutes. At the beginning this phenomenon is normal and it is advisable not to pay more attention to it, but simply to return to the chosen meditation technique, for example the breath, without effort or concentration. After the thoughts, colored emotions can appear, sometimes joy, happiness, sometimes anxieties, hatreds, aggressiveness. Violent or eroticized fantasies can arise with great realism, they follow the emotions and embody them. Again, the struggle is useless, and it is simply necessary to return to the technique without effort.

Overall, meditation is a holistic and circular process and the changes one will produce in the environment will help to break through these barriers, while breaking through the barriers will affect our willingness to change our environment, that is to say, finally, to detach ourselves from the fruits of action.

At the end of a variable duration according to the people, of a daily practice of the meditation, one reaches the state of mental condensation specific to the *Ish* consciousness. This state is recognized by the person being fully awake, alert and open-minded, but rested like still, clear water. Thoughts, emotions, and bodily sensations may appear, but they are no more than reflections on the quiet surface of the water of clouds passing in the sky above. The man is no longer in the turbulent river, but he is sitting at the edge and watching the waters flow by. It is therefore not a state of “emptiness” or

loss of consciousness, nor is it a trance or a coma and one does not sleep! It is from this clear mental condensation that the emission of *Ish* will be initiated, like the pulsed wave of a radar.

The traditions of prayer, magic formulas, mantras, show us the way: the *Ish* is a verbal formula. The reason is that language possesses a signifying function which, on its own, can convey the entire charge of a will. The sciences of language have discovered how language could be "action" (JL Austin): order, question, suggestion, promise, these are speech acts which have an influence on the minds and the contexts of the interaction between humans. It is through language that the political leader manages to convince, that advertising makes us buy. Its power is very great because it has a great power of evocation, of stimulation. It is still the language that is used in hypnosis, or in relaxation to calm and relax. It is the language that lovers use to give each other pleasure in all verbal caresses, with "I love you" and promises of a common future.

The formulation of the *Ish* must itself contain both the desire for change, but also the detachment from the current universe and, above all, from the embodied ego in this universe. Also all the formulas of the type "*Let this happen to me*," "*Let me get this*," or even "*Let this happen to somebody*," all these formulas are far too personal to make a good *Ish*. Moreover, they remain oriented towards this universe and therefore contribute to the effort to change things in this universe when the goal is to change universe.

The *Ish* must be impersonal and therefore renounce any interpellation of a divinity, which is ultimately only a grandiose projection of the ego. A good *Ish* is presented simply as a descriptive assertion, a simple assertion, which describes the result of the change, without asking anything, without highlighting the actors. A good *Ish* must also be quite general and strategic. It is necessary to avoid too centered

assertions and to choose, if one wants several things, the most general thing which will be able, by reactions, to involve the others. What we must not lose sight of, in the end, is that we are going to cause a quantum leap, that is to say a very small flick of consciousness which, step by step, will have great effects. Scientists call this the "butterfly effect" according to the famous image that a butterfly flapping its wings on one continent will cause a storm on another by the effect of the chain of events. Like a knocked down domino that knocks down all the others in a row. So, and to take another nice picture, it is about the *Ish* behaving like the pool player who is going to hit the white ball in the right place, with the right force and the right direction in order to provoke, by reaction, the displacement of the three red balls towards the holes.

Thus, we will not say "I want this," but "This wants me," "It happens to me." If no confusion is possible, one can even remove the ultimate personal pronoun and say "It happens," "It befalls," "Something is like this." We simply affirm and describe, but we ask for nothing, we wish for nothing, we do not envisage any action. The wording of the *Ish* should not be too long, no more than two or three words. It must be simple and direct, natural, like something obvious.

Thus, when we have reached the *Ish* state of consciousness, we will launch the *Ish* formula. The very precise method is as follows: the formula is simply thought out according to the fundamental principles of meditation, those of non-effort and non-concentration. Simply the formula is repeated mentally in the state of condensation. As it is a verbal formula, we will tend to play the vocal cords, or to follow the breathing, as if we were speaking aloud or if we were whispering. This is not the correct technique for issuing an *Ish.* The right emission must be independent of the vocal cords and the breath, it must be a pure mental *Ish* and if this is not the case, it is because the state of mental condensation,

the *Ish* consciousness has not yet been reached. It will then still be necessary to train in the practice of meditation.

Here is now the biggest secret regarding the emission of Ish: ***Ish* emitting must be associated with a mental wave**. The mental wave is a movement of the mind very difficult to describe, but quite easy to produce when one has reached the *Ish* consciousness. To trigger it, two techniques are proposed: either half-open your eyes (if they are closed) and for one or two minutes, launch the *Ish* by accompanying this mental emission with a circular gesture of the hand, from top to bottom, ahead; the second technique, examples of which can be found in moving prayers (such as the bodily sways of the Jews in front of the Wailing Wall), consists of slightly swaying the bust or the head in synchronism with the emitting of the *Ish*. With these techniques, after a while we will create a movement in the mind, as if something were moving in the head, rhythmically, a kind of undulation, more or less slow or fast and deep (once the mental wave is established, the bodily movement can be abandoned). This mental undulation corresponds to a psychic wave, only capable of carrying an *Ish* formulation that is effective.

The program for a half-hour *Ish* meditation can be broken down as follows: 1) meditate according to the technique for five to ten minutes to reach the *Ish* state of consciousness (advanced meditators reach this state almost immediately); 2) in the *Ish* consciousness, emit the *Ish* on the mental wave (launch this wave if necessary with the movements of the hand or the swings of the body) during the rest of the meditation; 3) if difficulties arise (appearance of parasitic thoughts), do not force the *Ish* emitting, but on the contrary interrupt it momentarily, to let these thoughts pass; 4) resume the emission of *Ish* as soon as the mental interference has subsided. It is advisable to always begin and end a meditation with a chanted ritual word (a mantra). In fact, the nature of these words does not matter (a few words in Latin or Sanskrit will do), the goal is to create a kind of conditioned

reflex in your brain and thus mark the cuts between before, during and after meditation.

You now know everything you need to know to change universe: renounce the fruit of actions, detach yourself from your current universe, practice meditation to reach *Ish* consciousness, from this state of purified consciousness (and after having constructs a good *Ish* formula), emitting the *Ish* on a mental wave. This is how we can act on quantum Chance and move from a parallel universe to another.

Until it does not work

The change of universe rarely occurs immediately. In fact, even if the leap from one universe to another happens in an eye blink, like the flick of the *Ish*, that flick can sometimes take a long time to happen. It is that, as with everything quantum, we are in a zone of indeterminacy, at the heart of all possibilities, in a cloud of probabilities. On the one hand, the exact conditions for this to produce the *Ish* (i.e. the *Ish* consciousness) are very difficult to achieve without long training and, on the other hand, the art of emitting the right *Ish* is not no more given overnight, errors are possible, or else *Ish* will be aborted. Finally, from the point of view of the multiverse, time hardly matters. Whether an *Ish* takes effect in ten minutes or in ten years, from this point of view the difference is irrelevant.

It should be known that the universe change occurs spontaneously just after death. Indeed, this is what the famous and secular theory of reincarnation had guessed. In fact, there is no reincarnation as it is said “in this world, in another bodily envelope.” No, this story of the bodily envelope is no longer relevant if we consider the supremacy of consciousness according to the transcendental epoché carried out above. What exactly happens is that our individual consciousness corresponds to one of the possible universes. This consciousness develops gradually, this development being symbolized by the ages of life: the

newborn, the infant, the young child, the adolescent, the adult and the old man/woman. This unfolding marks the gradual exhaustion of the consciousness-universe which ends up "extinguishing." This extinction corresponds in fact to a return to the point of junction of possibilities, in the state of quantum coherence. Subsequently, a new quantum decoherence will be produced, towards another parallel universe, in the form of a new embodied consciousness. Generally, there is a certain proximity-continuity between two parallel universes, which represents a kind of "memory" and it is what makes say that each one learns some lessons in this life, the benefits of which will be transferred in the next. In reality, one must above all not believe in a true individual consciousness which would travel from universe to universe. Rather, it is a matter of fairly impersonal existential proceedings as a whole, sorts of fairly "mechanical" processes of consciousness, and individuation is only an illusion.

Simply, to emerge, from the point of quantum decoherence, the universes need this energy-matter-consciousness alloy, but whether the consciousness is that of Mister Smith, or Miss Doe's has absolutely no importance with regard to the multiverse. It is ultimately the consciousness itself that swells with the belief in its own existence and permanence. As far as the emitting of the *Ish* is concerned, it is finally to produce a universe change before the natural post-mortem change, there is nothing more mysterious!

These conceptions of the multiverse also allow us to understand the prohibition imposed by all religions on the act of suicide. In fact, a suicide carried out in a state of distress consists in hastening the shift into another universe which, precisely because of this particularly troubled state of mind, risks taking place according to an orientation that is at the very least infernal. Conversely, the provoked "suicide" (by controlled cardiac arrest) by the great masters in yoga, who have attained perfect mastery of body and mind (that is to

say of *Ish*), leads them wherever they want, in any parallel universe. These great souls can just as well renounce all reincarnation and allow themselves to rest at the node of quantum coherence (this is the Buddhist *Nirvâna*).

If we now consider first the most common impediments in the production of a quality *Ish*, we can without hesitation mention precipitation. There are many people who, drawn by their desires, embark on attempts to emit an *Ish* without having sufficiently progressed in the path of detachment, meditation and the realization of *Ish* consciousness. This haste also shows that the person is far too attached to the fruits of his actions to be able to hope to produce a quality *Ish*, if not even an *Ish*!

For those who have never practiced meditation, in any form whatsoever, the first step is not the emission of an *Ish* (as if we were asking a child in kindergarten to solve equations!), but the discipline of a daily practice of meditation. The duration of this learning can in no way be estimated seriously, because everything depends on the *karma* of each and each is different on this point. For one *Ish* consciousness will be reached in a month, for another in six, for yet another in six year…

Necessary, meditation is however not sufficient. How to claim to arrive at *Ish* consciousness and change universe when one persists in clinging to the round of desires in this universe, when one is strongly attached to the fruits of actions. There is therefore also a certain stripping of life to be achieved, a certain "purification" of body and mind to be undertaken gradually. A moral cleanse too, because if you can get everything with a universe change, you may as well find yourself in one of the multiple versions of hell. The *Ish* is therefore not without danger or without risk.

If our life is purified, if Ish consciousness is achieved well, another impediment can be produced by wrong formulation of *Ish*, or by hesitant and changing formulations. An *Ish*

formulation must be particularly well chosen from the start and one must strive not to change it until the leap has occurred. With each change, everything must be started from scratch, because it must be understood that the leap will occur suddenly (often at a very unexpected moment), following very subtle conditions that it is not possible to apprehend correctly and that we never fully master. Just as nature produces millions of spermatozoa while only one will trigger fertilization, so it is sometimes after the emission of hundreds of thousands of *Ish* that only one, almost by chance, will produce the switch to another universe. This shows the constancy attached to this method, the discipline and the precision that must be put into it. At the same time, in a way that is difficult to explain, the leap can occur almost instantaneously, it is a miracle, but we also know that it is very rare… The fact remains that when you have meditated for a long time with a well-chosen *Ish* formulation, there is more and more ease in emitting *Ish* and, consequently, the probability that an *Ish* will end up causing the leap is enormously increased.

Another barrier to the *Ish* is the charge of desire that will be moved onto the *Ish* itself. We have said that one of the major conditions for achieving *Ish* consciousness and emitting good *Ish* is detachment from this universe. Sometimes it happens that a person is so fascinated by a desire, by its realization, that his consciousness is far too disturbed to be able to reach the state of *Ish* harmony. Attachment to the world and to desires causes serious disturbances in the psychic field of consciousness. Meditation is hampered by this and, even if a certain *Ish* consciousness is reached, the emission of *Ish* is blurred by the parasites of a too great desire. Remember the metaphors of the tale of the salt statues, or beauty and the beast. If you find your universe “monstrous,” if it particularly displeases you, if it dissatisfies you deeply, you must however love it enough to detach yourself from it, because hating it and too

vigorously agitating desires for change maintains the chain to this universe. Never forget that this whole universe is an expression of your solipsistic consciousness and that this consciousness itself does not belong to this universe, but to the "sleeper" who thinks this great dream of the universe. As it says throughout the Tibetan Book of the Dead: you must not attach yourself to phenomena which are only a manifestation of your own mind.

The conditions for emitting a good *Ish* require us to become "passive" in the face of this universe of ours. Becoming "passive" does not mean amorphous and immobile, but while doing what needs to be done, it is about not expecting anything from the results of actions. It is in the same way that the experience and practice of meditation must be approached, in the same way the experience and practice of *Ish*. We hear behind us in the plain the cries and the groans of the ego who desires, who wants, who waits, who hopes, who is impatient, but we do not look back at these cries and groans, we continue straight across the plain and, with firmness, one maintains the spirit on the pure and stripped consciousness of *Ish*.

At other times, we can have the impression that something is beginning to change, we have the impression of perceiving "signs," "that's it!," thing is happening. At that time there are many people who get a little too excited, who sometimes panic, all fascinated by the joy of feeling the shift to the other universe occur. And then the disappointment comes sooner or later, because the restlessness itself, the excitement, could have disturbed the leap. There again, the hero had practically crossed the entire plain, he was nearing the goal, but at the last moment he "cracked" and that is what made him fail. What a disappointment to often annihilate years of detachment and discipline for a moment of thoughtless haste!

As a general rule, the handling of the *Ish* requires a lot of discretion and secrecy, even towards oneself! You should never talk about this to anyone, never reveal your *Ish* formulation, never claim that you have changed universe. All these indiscretions and these boasts are powerful disruptors of the course of things and annihilate in a few moments the best of the meditative disciplines and the best of detachments. Talking about the *Ish* is to go back down to the level of the embodied ego and of desire, it is to plunge back into a state of fascinated consciousness that is contradictory to the state of *Ish* consciousness. For oneself one just has to have an *Ish* intention at first, then let yourself go to meditative discipline and forget about it! The *Ish* produces its effect because we do not particularly think about it, because we let all that act alone, in confidence, because this confidence is itself at the base of the *Ish* consciousness. Who panics, who keeps thinking about the change of universe, will never change universe, because panic and obsession will bind him forever (at least until death) to his current universe.

Here we can usefully remember how Jesus Christ performed his miracles. This master of *Ish* worked entirely on faith and trust: "Go home, your daughter is healed," "Get up and walk," "Do you believe that I can do this?" He asked the two blind men before restoring their sight. Because if we believed in Him, then the miracle could be realized, or more exactly a universe change. This ability to produce and emit *Ish* with instant effects is very rare, but it allows us to understand, in an accelerated way, what state of mind we must be in if we want it to work one day.

A final barrier to the realization of *Ish* comes from *karma*: your *karma* may be such that this universe leap you desire cannot occur. What is *karma*? In metaphor, it is the baggage of merits or demerits gained in past lives. More exactly, it represents the consequence of the thoughts, feelings and actions in this life and the following ones. In fact, *karma* should rather be seen as bundles of similarities between close

parallel universes. This means that at the junction of all possibilities, universes can share major trends in terms of events. It may happen that from the point of view of the incarnated individual consciousness, such an event is impossible (or on the contrary constantly reproduces itself). In this case, a switch to another universe will not lead to a major transformation of the course of things and the person will feel that his *Ish* emissions are not working. In such cases, which are not so rare, with the help of a spiritual master, the person will have to reorient his whole life, in depth, to be able to move away from these bundles of phenomena.

Whatever the barriers to the action of the *Ish*, do not forget that renunciation and discipline are the two main skillful means to make the emissions of the *Ish* effective and to give you the chances of universe change during this life.

Perhaps certain readers believed, at the beginning of the reading of this work, that they were going to be able to have everything, easily and immediately. By now they will no doubt have understood that it cannot be so. If it is difficult, sometimes impossible, to make things happen in this universe which is ours at present, the universe change, much easier in principle, requires from us a quality that is very difficult to achieve for many of us: detachment.

Without this detachment, we remain too tied to this present universe to be able to leap into a neighboring universe. It is the desires, the loves and the hatreds, all these emotions and these fascinations which attach us, disturb us and prevent us from reaching this pure *Ish* consciousness necessary for the quantum leap. Also, the teachings of *Ish* open us to a new understanding of morality. Goodness, compassion and love are not meant to satisfy others, nor to earn us good points for the hereafter, but to lead us on the path of detachment. Hate and selfishness fundamentally bind us to this universe which is ours, first through our desires, our fascinations, all these ambitions for power over

things and beings. Then we shall talk about it right away, our bad deeds bind us through cause and effect, turning the harm done to others against us. Conversely, goodness and compassion for others free us. Why such a release? Provided that compassion is not a disguised aggression, a means of manipulating the other, of dominating him, provided that our love does not circulate on the same circuits and at the same speed as the hatred of others (C. Trungpa), then, compassion is liberation because it implies, in its very principle, self-forgetfulness, the abandonment of our vain, petty, and egocentric wills. The good therefore has no value in itself, but in that it frees us, including its effects on the karmic level.

Before really wanting to make a quantum leap to another universe, a parallel universe that you expect to be better (for you?), you must be aware of all the consequences that such a leap can have. Each universe forms a gestalt, a good form, a sort of system where everything is connected, where everything enters into a certain harmony. This harmony is due to all the causes and effects which reverberate gradually and invade the whole universe. Thus, a few grams of violence end up extending until producing a real hell. Conversely, love and compassion can have great beneficial effects on an entire universe. This means that you should beware of desires that you would like to see fulfilled with the help of Ish. If you emit *Ish* to make a jump to a universe in which you would be avenged for a wrong by violence, or in which you could perform bad deeds, you must understand that, if this jump occurs, this universe will end fatally by adopting the *gestalt* of this initial will and the harm you have caused will always end up turning against you: you will have thus created an infernal universe. It is for this reason that you would be very misguided to consider using the powers of *Ish* to do anything and more particularly evil. That said in a rather theoretical way, because you will have understood it, unless there is a particularly devious Machiavellian will, it seems unlikely, for

the reasons explained above, that a person guided by evil can detach himself sufficiently from this universe that is his to move on to another.

May the men and women who attain *Ish* consciousness make good use of this power, for their benefit and that of all sentient beings. *Ish* power is gained through detachment and love, it should only serve liberation and universal compassion.

The third physics

Research and thinking on the nature of our universe are as old as the history of Humanity. The very first philosophers theorized that the most fundamental element of the universe was water. Later, as scientific knowledge began to mature, our view of the universe became more complex, and for many centuries it was a widely held belief that the four main elements of our universe are earth, air, water and fire. Later, research focused on chemical elements, molecular structure, atoms, electrons, quarks and all the bestiary of fundamental particles. More recently, the advent of quantum physics has led some of the most eminent researchers[4] to conceive that the most fundamental element of the perceptible universe is not found in particles, in force fields or in energy, but in information and mathematics.

For the great mathematician Alain Connes, mathematical principles exist independently of Humanity. Unlike human languages or computer algorithms, the fundamental relationships known as “mathematics” are a constituent part of the universe. There might be no one in the universe, no consciousness, that languages and computing would disappear, but mathematical relationships would still exist. It is indeed a set of fundamental rules that order the universe. And it is this evidence of the mathematical substrate of the universe that has led many researchers to design the informational foundations of the world.

Thus, modern developments in cosmology are increasingly oriented towards an informational view of the universe. As theoretical physicist John A. Wheeler wrote, "the third physics[5] is that of information-based physics." In addition to this informational vision, there is a second framework of thought that is essential today: the quantum model. So, the informational ontonomic model of the universe, or ontonomic cosmology, which we are going to describe in this work, proposes to approach cosmology according to these two perspectives, informational and quantum, by adding the ontonomic dimension.[6] This last dimension is derived from ontological thinking, which is metaphysical, as a science of Being in general. If ontology studies the metaphysical problem of absolute Being, for its part, **ontonomy[7] studies the informational laws which presides over the physical (phenomenal)[8] expansion of Being**.

The first formal presentation of the idea that information could be at the heart of all physics goes back to the work of Frederick W. Kantor (physicist from Columbia University), "Information Mechanics," published in 1977.[9] As Wheeler said, in a lapidary formula:[10] "It from bit," or everything originates in information. And, since Wheeler speaks of "bit," it is indeed binary information: 1 or 0.

For Wheeler, every particle, every force field and even space and time come from a binary choice system in 1 or 0. This binarity of things being the basis, both of their function, of their meaning, and of the totality of their very existence. This means that each thing, aspect, of the physical world has an immaterial origin and explanation. For Wheeler, what we call "reality," ultimately, comes from a binary yes-no process, and all of physics is information theory in a "participatory universe" (the presence of conscious observers in a universe would determine the primordial structure of this universe, we will come back to this).

For David John Chalmers (Australian philosopher),[11] Wheeler therefore suggested that information is fundamental to the physics of the universe. According to this "It from bit" theory, the laws of physics can be translated into information. The different states of things, of particles, atoms, molecules, systems, whether non-living or living, including thought, consciousness, result from their underlying configuration in an information space. For Chalmers, information plays a role in a fundamental theory of world consciousness on a phenomenal level.

Increasingly, for physicists, what is called and recognized as material reality, everything you taste, smell, feel, touch, hear, see, whether it is your child playing at your feet or distant galaxies discerned through a powerful telescope, all of this is nothing but a gigantic hallucination, the translation in the form of phenomena perceptible in our consciousness, of information which is its substrate. The relationship between this information and the universe, as we experience it, to take an approximate image, is the same as between a video file (which contains only bits, digital information, 1 or 0) and the entire universe of a film with its objects, landscapes, characters, sounds and distant galaxies, if it is a Science-Fiction film. We are like characters in a movie on the scale of the cosmos, a movie that would take place from the playing and decoding of underlying primordial information.

Initially, physicists dealt with the physical world, matter and forces, energies, masses in motion which form its dynamics. Until Newton, Maxwell, Ampère… things were easy: I see what I touch and I touch what I understand. And then, by dint of scrutinizing matter and energy more and more finely, with Einstein and Planck, Schrödinger, Bohr, Heisenberg… things became much less obvious, in any case more complex and certainties gave way to probabilities. Starting with the dual nature of the elementary constituents of matter-energy: both waves and particles.

The light was first observed sometimes as a wave (the interference fringes), sometimes as a particle (the photoelectric effect). But afterwards, everything took on this duality: electrons, atoms, molecules… the stones of the path. And this duality, this superposition of quantum states, can no longer be seen and touched in a simple and direct way. It can only be apprehended and mathematically determined by means of a mathematical abstraction: a "state vector in a Hilbert space." Our eyes and our ears are no longer enough to perceive the world, because we are at the synthesis of linear algebra and topology, we are now in information, in mathematical information which prefigures this primordial information at the basis of everything that exists.

As the physicist Christopher Fuchs puts it so well, we have moved from quantum physics (or mechanics) to a "quantum theory of information." The quantum system represents something real and independent of us. What are called "quantum states" are a collection of subjective degrees of a representation about *something* to do with the system, in the context of experiments in physics. Quantum mechanics is therefore at the interface between this subjective representation and physical experiments. "Quantum states" (for example, a photon in the wave state or in the particle state) are that subjective information (conceived in the mind of the researcher) that connects us to more concrete things. Obviously, the observers, the scientists, the physicists in their laboratories, are not a necessity for reality to be reality; but each time they come on the scene, each time these observers do an experiment, each time they observe and measure, they change things, they modify quantum reality.

Quantum information theory is therefore a theory that describes the "behavior" of information. The next objective of fundamental physics, specifies the physicist Jeffrey Bub, will be to describe these informational behaviors, the exchanges and the transformations of information, to describe the universe. For Alexei Grinbaum, philosopher, it is even

possible to go even further and he proposes that physics should henceforth only be interested in information in itself, that it get rid of "representations" of a reality anyway inaccessible.

Michel Bitbol, French philosopher, drives the point home by seeing in this new informational approach a decisive sidelining of the metaphysical realism that prevailed in the physical sciences. From now on, physicists themselves are more and more attracted towards a more idealistic point of view, a transcendental reflection à la Emmanuel Kant (philosopher, founder of transcendental idealism) or Edmund Husserl (philosopher, logician and mathematician, founder of phenomenology). Thus, reinterpreting and understanding time, space, force fields, matter-energy, in terms of information, is the agenda of the physics of the third millennium.

Scientists, like the mathematician John Barrow, are even beginning to draw the consequences of this informational approach to the world and to propose cosmological scenarios, very close to Science Fiction, but quite plausible. There would exist an informational "matrix," outside of time and space, and it is from the information "read" in this matrix that the whole universe would appear and unfold: galaxies, black holes, stars, planets , living beings and us, humans, all in a spatiality and a temporality themselves produced from the sequential playing of information from this transcendental matrix.

For the moment, no experiment can account for such a hypothesis, but everything in quantum physics pushes us to formulate it, support it and seek to demonstrate it. And, in this sense, the informational quantum physics joins idealist metaphysics, for which nothing exists outside consciousness, because everything that we can never know will **only** be in (our) consciousness.

And consciousness itself is reduced to information: the world only exists for us by means of the information that we have of it in our consciousness. There would therefore be links between this possible informational matrix, at the base of the universe, and consciousness. Links, therefore, between our consciousness and the existence of the universe. What links? This remains to be clarified and it is indeed the object of this book.

Now, for many physicists and philosophers, all the concepts used to describe the universe, whether matter, energy, movement, force fields and even space and time, must be reinterpreted in terms of information. Thus, it is Einstein's theory of general relativity which must also become an informational theory of space and the movement of masses. And, as Carlo Rovelli and Lee Smolin, both theoretical physicists, point out with their theory of "loop quantum gravity," space is nothing more than a fabric of interactions, therefore a web of information about to these interactions. We can think of space as a network of fundamental interactions, therefore an information transfer network.

About time, as the philosopher Alexei Grinbaum argued, it is the product of our ignorance. Explanation: time would simply be the expression of the speed of information processing by a consciousness. It is therefore not a question of an absolute, independent time, but of a temporality of consciousness at work or, in any case, of *THAT* which "reads," "processes" the information which constitutes the universe, to bring it from the informational state to the phenomenal state. As the great Einstein said: "Time and space are concepts in which we think, not in which we exist." Fabulous intuition of this great thinker!

The theory of loop quantum gravity, by Rovelli and Smolin, posits that space is made up of small grains, "loops," whose size is the Planck length (10^{-35} meters), the smallest

length in the universe. These loops therefore form indivisible units of space. Time itself is not continuous, but flows according to indivisible units, the Planck time (10^{-44} seconds). And the two are connected, the grains of space and the grains of time, both indivisible, accounting for the changes that are constantly occurring in this matrix of information[12].

Further, the mathematician Juan Maldacena, proposed to interpret the gravitation, not like a simple force like any other, but like the result of informational interactions located on a two-dimensional matrix which, itself, is with the variation of any force, including gravitation, being a purely informational matrix. From there, the physicist, Erik Verlinde, wondered about how the information is coded in this matrix. With other researchers[13], he argues that this two-dimensional matrix (therefore, flat, like a screen) is holographic in nature and the quantity of information would be proportional to the surface of this matrix. Verlinde's hypothesis is that there is information, which is structured in an abstract "space" and which encodes the phenomenon of gravitation. This "force," which attracts the masses between them, would ultimately be only an illusion of force, an effect of the modification of information in this abstract matrix.

Max Tegmark (Tegmark, M. (2008). The Mathematical Universe. *Foundations of Physics*, 38, 101-150) abounds in this concept of an informational universe by associating two hypotheses: 1) there exists an external physical reality completely independent of us, humans; 2) this external physical reality is a mathematical structure. From the mathematical demonstration of these assumptions, Tegmark shows that this agrees with the Newtonian gravity approach of particle points, with Einstein-Maxwell general relativity, and with quantum field theory, all three defining the universe as a mathematical structure. The universe therefore becomes a mathematical object that can be studied. This explains in reverse the "the unreasonable effectiveness of mathematics in the natural sciences" (Eugene Wigner).

Before closing this chapter on the "third physics", informational physics, it is certainly important, for many of our readers, to know a little more about this "information" which would be the basis of all things.

From a scientific point of view, which is ours, "information" is much more a notion than a real concept. A concept is a general and abstract mental representation of a thing, of a phenomenon, a representation which creates consensus, at a given moment, for a community of knowledge, that is, for what concerns us here, the scientific community of physicists and philosophers of science. This is the case with the main concepts in physics, such as weight, mass, energy, force field, motion, etc. On the contrary, a concept is rather a general intuitive representation which makes the synthesis, at a given moment, of the essential characteristics of a thing, of a phenomenon, without being able to claim the consensus of the scientific community.

As such, the term information currently corresponds to a notion, because if you question two physicists there is little chance that they will give you the same definition of information. This means that there are several intellectual currents for a theory of information. At both ends of the spectrum of definitions, information can be, for some, something quite physical, perhaps not a particle, but something like a field or a force. While for others, at the other end, the information is pure figment of the imagination. In between, others may think that information is like a kind of language, a mathematical tool, what circulates "computing" in the circuits of a computer and so on.

For example, in the information theory of Shannon and Weaver[14], information is a purely mathematical notion, linked to randomness and probability. And it is probability that is the basis of the definition of information. Or more precisely, what is information is what is improbable. For example, series of 0 or 1 (000000000000 or 111111111111)

are not, in themselves, very informative. On the other hand, as soon as appears, in a very improbable way, a 1 in a series of 0 or a 0 in a series of 1 (0001000000000 or 1111111101111), then there is information that appears there. This is why in binary information systems, as in all computer science, with only series of 0s and 1s, it is possible to encode texts, images, videos, music or more computer programs, intended to process information.

Human languages are also information systems based on the permanent use of the improbable. Each sentence we utter is a series of improbabilities, right from the first word. Will the speaker speak or not? Will he say: "The," "A," "This," "So," "I" and so on? But once he has formulated his first word, say "The," what will be the second? Will he say: "cat," "dog," "cloud"…? And if he says "The cat," will he add an adjective? Which? Or a verb? Which? In the end, from improbability to improbability, a sentence like "The cat eats the mouse" represents remarkable information, at least at the time it is emitted. But when you read it, the first sentence of the next paragraph is even more remarkable!

Information is therefore basically an abstract notion, it is both logical and symbolic. But information cannot exist without a more or less material medium, both for its storage (memory) and its creation, transformation, circulation. It is in a completely material organ, the human brain (or that, more or less complex, of other living beings) that information is processed, analyzed, memorized or created. **Our thoughts are information.**

From rock paintings in prehistoric caves, to our sophisticated computers, to language and writing, we have invented countless ways to process, store and circulate information.

However, we have to leave these anthropocentric points of view to properly perceive and understand the full extent of the information phenomenon. This then comes to merge

with another notion, that of interaction. We ourselves produce or access information through our interactions with our environment. Interaction refers to the physical, to contact, whether tactile, mass, auditory through air vibrations, visual through light photons and so on. **Interaction produces information.**

This applies to all systems, from the most complex (like the human being and his big brain and the interaction of its neurons) to the most elementary, like a bacterium, a DNA, a virus, a molecule, an atom, a fundamental particle. Moreover, the fundamental particles are subdivided into two large groups: fermions and bosons. The fermions are the particles at the base of matter-energy (electrons, quarks, neutrinos, neutrons, protons…) and the bosons are the mediating particles of forces. They are the ones that ultimately account for the interactions between fermions, and therefore the information that circulates between the fermions.

But all that we have just said about information and its physical storage, processing and circulation media, does all this really concern this "INFORMATION" which would be the basis of all things, of the universe or universes? The answer is definitely: in no way! And this is the rather fundamental error that many physicists and philosophers make. This information, which is the substrate of the universe, of all phenomena, according to the conception of an informational universe, is also the basis of… the information which is stored and circulates at a phenomenal level, that of our daily life, of the world as matter, energy, force field, in a spatiality and a temporality. Also, the information at the base of everything cannot be identical to phenomenal information as we perceive, process and use it.

Information, from the point of view of the informational universe, of the matrix at the base of the whole universe (or of all the universes), this information is not registered in a matter, an energy, a field of force, because it is it which is at

the origin of all this: matter, energy, force field. Similarly, this primordial information is not inscribed in a space and a time, because it is it which is at the origin of space and time. This primordial information is most certainly binary, because binary is the most elementary of information and it is enough to build all the other more complex forms of information. It most certainly follows a principle of improbability, because an infinite series of 1s or 0s will never be able to provide the information necessary for the complexity of the phenomena of the universe. The primordial information is therefore an improbable series of 1 and 0[15].

Now, as to what exactly this primordial information is, where it is located, how it is organized, how it is transformed into a phenomenal universe, this is what we will see in the presentation of an informational ontonomic model of universe, based on the ancient texts of Buddhism. But first of all, in the next chapter, we will deepen this junction between informational quantum theory and idealist metaphysics, no longer with the contributions of Western metaphysicians, but from an exegesis of Hindu and Buddhist metaphysical texts.

INFORMATIONAL METAPHYSICS

Let's start with a little reminder, for readers who are not well versed in the mysteries of metaphysics. We will go to the simplest. Metaphysics can roughly be summed up in two major opposing currents of thought regarding the existence of the world, of the universe: realism and idealism. All the other philosophical currents are, either directly and explicitly, or indirectly and implicitly, related to one or the other branch, realism or idealism.

For the realist, the world outside consciousness exists and he develops a whole host of arguments, each more clever than the other, to demonstrate it.

For the idealist, nothing exists outside of our states of consciousness. Or, in any case, if there is something, it is not possible for us to demonstrate it, since everything that we "know" we know it in consciousness, in our consciousness.

The battle of ideas between realists and idealists has been waged for centuries by philosophers of all cultures. It is found in ancient India, ancient Greece as well as the West of the 18th and 19th centuries. The fight is still going on today… Is there a winner? Or has one stream garnered more points than another? So far, all fights ended in draws. To put it simply, it is not possible to demonstrate that there is something outside of our consciousness (idealist thesis), but it is also not possible to demonstrate that there is nothing

(realistic thesis). We end up with a philosophical indeterminacy, which damnably resembles Heisenberg indeterminacy relations, which paved the way for quantum physics: it is not possible to know precisely both the position and the speed of a particle. Which is only a particular case of this relation of indeterminacy, applied to the values of position and momentum. In fact, this relation of indeterminacy is valid for all systems and their operators, for example: the cinematic moment in the orbits or spins of particles, the time-energy relation…

We will now examine the theses of the four main ancestral schools of Buddhism: Vaibhāshika, Sautrāntika, Yogācāra and Mādhyamaka. However, remember that this modest work is not a treatise on metaphysics, so we will obviously remain at a very simple and easy to read level of analysis.

The Vaibhāshika school

The Vaibhāshika school had a great influence in India and beyond. It originates from the ideas of the oldest Buddhist sect: the Sarvastivadim, who are considered integral realists. Thus, for the Vaibhāshika, who took over the teaching of the Sarvastivadim, all phenomena are "objective," this means that they have a real existence outside of the consciousness that one can have of them. And it is the intersubjective agreement which, for them, demonstrates the objectivity of phenomena.

Try this experiment: you go outside on a full moon and cloudless night, accompanied by a friend. Looking up to the sky, you both see the Moon. The Moon is a "shared object," shared between you and your friend. You both see the same Moon and if you compare your descriptions (assuming you both have good vision) you will agree that it is the same object, which is not more proper to your friend than to yourself. And now, if your friend closes his eyes or goes home, you will continue to perceive the Moon. And it will be the same, if it is you who close your eyes or go home, your

friend will continue to see the Moon. The Moon is therefore indeed an objective object, outside your two consciousnesses, although you and your friend only perceive this object in your respective consciousnesses.

Of course, this experiment and this demonstration of objectivity are valid for any other object in the universe, for the whole universe, for all phenomena. This objectification through intersubjectivity (the fact of sharing the same experience with the other) also applies to everyone else, not just your friend. This goes even with your dog to whom you send the ball to bring it back to you. This ball is indeed an "objective" object outside your consciousness, as well as that of your dog. Living bodies are themselves objective, yours, that of your friend or any other person, of your pet, as well as the signals they emit, the sounds, the voice, the language.

For the Vaibhāshika, the objectification of phenomena passes through the five senses (sight, hearing, touch, smell, taste) and the objectification of one's own body through cenesthesia, this sixth sense of internal sensations (muscles, viscera, organ of balance…). Moreover, thought itself depends on phenomena for its existence: no phenomena, no thought. No mental concept can therefore be formed, except by direct contact between the mind and an external object, through the intermediary of the senses. And, of course, when no mind is conscious, does not perceive it through senses, a body, this object (and the whole universe) nevertheless exist, independently of any mind.

The Vaibhāshika school therefore developed a materialist philosophical approach, within the framework of a realistic thesis, for which there is a mind and a universe which is external and separate to it. The somatic, bodily system, of sensations (today we would say the central nervous system, the brain) making the junction between the two: mind and universe.

The Sautrāntika school

Although the Sautrāntika school also stems from the ancient Sarvastivadim school of thought, its approach to the problem of the world outside consciousness is significantly different from the Vaibhāshika approach. The Sautrāntika take up the approach of realistic materialism of the Vaibhāshika, but analyze it differently.

For this school of thought, there is no such thing as mind and phenomena separate from mind. In fact, the universe is a pure illusion and we see this in the fact that the states of consciousness are inconsistent: the thoughts fluctuate constantly, are transformed, thus demonstrating that there cannot be a consistent world to which they would feed. Our thoughts (made of sensations and perceptions) about the world are, of course, a little more substantial than the thoughts of our dreams, but in the final analysis, these are all just thoughts.

For the Sautrāntika, phenomena and thoughts form inseparable and indivisible units, sorts of consciousness-phenomenon atoms which are linked together, forming series of successive states of consciousness. There does not exist a permanent and stable world which would be the substratum of the world of phenomena to consciousness. Moreover, the phenomena-consciousness atoms have no proper duration, they are only a series of successive instants which, in their sequence, give both the illusion of a permanent universe and that of a permanent ego who would perceive this universe.

From the Sautrāntika point of view there is not you, your friend and the Moon. But two series of atoms phenomenon-consciousness "you-friend-Moon." So there is no Moon that would be objectively outside consciousnesses (that of your friend and yours), but Moon-consciousnesses that have, in a way, the same dream. However, we are not yet in a purely idealistic perspective. For the Sautrāntika there does not exist

a permanent world outside consciousness, which would be perceived and conceived in a past-present-future temporality. But there is all the same a substrate, which is evanescent, which only appears in an instant and disappears immediately and it is the succession of appearances-disappearances, in the present, which gives the illusion of a permanence of the world, a bit like the succession of still images in a film gives the illusion of movement.

As for consciousness, the ego, it is only the consequence of the successive series of appearances-disappearances and its permanence is just as illusory as that of phenomena. In summary, for the Sautrāntika, there are no objects outside of consciousness that are truly existent and consistent, like a Moon in the sky. What is, they are inseparable atoms of consciousness phenomenon which appear from moment to moment, to disappear immediately. The Sautrāntikas join in this the original conception of the Buddha about impermanence: the whole phenomenal universe is impermanent, changing, everything is instantaneous, an atom of indivisible time.

All things in the universe, including our bodies, our thoughts and our emotions, are destroyed, disappearing at every infinitesimal moment and are replaced by similar phenomena which are produced, generated, the next moment, to be immediately destroyed and replaced. And so on. The successive births and destructions of phenomena are spontaneous and therefore causeless. Moreover, the past is only memory and the future is only imagination, thus past and future are themselves reduced to phenomena which appear and disappear from moment to moment. To finish with the Sautrāntika school, we can notice that its “atomist” and “instantaneous” conception prefigures and agrees well with modern quantum conceptions of the universe, matter, space and time.

The Yogācāra school

The Yogācāra school (or Cittamātra or Vijñānavāda) is one of the two most important schools of Indian and Tibetan Mahāyāna Buddhism, along with the Mādhyamika school. We have just seen that with its concept of phenomenon-consciousness atoms, the Sautrāntika school, maintains the existence of a world external to consciousness, although world and consciousness begin to lose their distinction. With the Yogācāra school, a further step is taken in the direction of true idealism. Indeed, for this school, it is not possible to prove the existence of a reality external to consciousness, since we never have access to it. All of our experience of the universe is ultimately mental.

Let's go back to our nocturnal experiment: "You go outside on a full moon and cloudless night, accompanied by a friend. Looking up to the sky, you both see the Moon. The Moon is a "shared object," shared between you and your friend. You both see the same Moon and if you compare your descriptions (assuming you both have good vision) you will agree that it is the same object, which is not more proper to your friend than to yourself. But, with the Yogācāras, let us pause for a moment to think.

Your friend is handy, but what is his actual status of existence? From the perspective of your own consciousness, is there a difference between the Moon and your friend? If you are thinking carefully to this question, you will easily agree that there is no difference: the Moon, like your friend, only exists in your own consciousness. This friend being only a witness in your mind, telling you "I see the Moon, just like you and it is like this and like that." This friend is a "fake friend," he in no way proves that there is a universe outside of your thoughts. This witness of an external world being himself in your thought does not in any way prove the real existence of the world external to your thought. And even if this witness, your friend, affirms to you that he too perceives

you in his own thought just as he perceives the Moon there, that does not prove anything, because it is ultimately only a kind of character in your own thought in claiming a consciousness of its own, when this character is ultimately only a mental element, in YOUR own thought.

This situation, where we recognize that the only thing we know and will never know is our own thoughts, this bizarre and uncomfortable situation is called "solipsism." Rest assured, you are not God, the only thought, the only consciousness of the universe! For the Yogācāra school, the fact that we are never in direct contact with matter, with real things, including other humans, leads to the denial of the existence of a reality external to the mind which perceives this reality. From there, the Yogācāras consider that phenomena and consciousness are identical and the phenomenal universe is similar to a great dream, not very different from the night dreams that we happen to have. As the Buddha himself said: "This world is only thought."

In metaphysical reasoning, solipsism is only an intermediate and provisional stage, a bit like when in summer, one leaves a dark house to go to a brightly sunny terrace, one has a brief moment of dazzle, but it eventually passes. The Yogācāras thus manage to go beyond solipsism by considering that what thinks the universe is certainly not one or the other of the embodied and ephemeral little beings that we all are, we human beings. Each of us is just a small character in the big dream of a global consciousness. However, it is useless to expect Yogācāra to deify this cosmic consciousness: it is not God, it is not a personality, a "spirit" in the animist or religious sense of the term. In fact, this global consciousness is impersonal, insubstantial and timeless. It is only a consciousness at the base of the whole universe, or *Alayavijñāna*, the fundamental consciousness. Also, your friend and yourselves and all other living, sentient and thinking beings, just like all material things, from the mountains to the stars, are expressions of this global

consciousness, a bit like the multiple reflections of same Moon on the waves of a pond.

The Mādhyamika school

The second major school of Mahāyāna Buddhism is the Mādhyamika school. It was founded by Nāgārjuna[16], as the "middle school", based on the metaphysical teachings of the Buddha: Prajñāpāramitā. The Mādhyamaka[17] approach is particularly difficult to understand, it requires a lot of attention, to also appeal to intuition rather than reason alone. This metaphysical approach does not follow an entirely Western logic either, that of Aristotle, to which we naturally adhere and which is the basis of all our relationships with the world and with others. The Mādhyamika approach is part of a logic of "undecidability," which we will see first, so that things are as clear as possible for the reader.

Undecidability

Mādhyamaka means "middle way." This school also speaks to us of "vacuity," of emptiness, of nothingness, according to the translations, most often erroneous, of the word "*Śūnyatā*" (pronounced shoo-nıa-ta). These two notions, "middle way" and "emptiness," both correspond to this logic of undecidability (which is not decidable).

To understand what undecidability is, we must start from the basic logical figure: the tetralemma. This figure is binary and confronts the existence of two opposing statements. Here is the general structure of a tetralemma:

1. *P* is true
2. *not-P* is true
3. *P* and *not-P* are both true
4. neither *P* nor *not-P* is true

Let's take an example with a simple and trivial statement, easy to understand: "the cat is an animal." Here is the tetralemma produced from this statement:

1. "the cat is an animal"
2. "the cat is not an animal"
3. "the cat is an animal and is not an animal"
4. "there is neither cat which is an animal, nor cat which is not an animal"

For Aristotle[18], two contrary statements cannot be true at the same time. You have to choose, either the cat is an animal (1), or it is not an animal (2). What we can formulate by associating the two statements with the operator "or":

"the cat is an animal **or** the cat is not an animal"

This statement, which poses an exclusive choice between two contrary statements, is called a dilemma. For Aristotle, only dilemmas are logically valid. The scenario (3): "the cat is an animal **and** is not an animal," represents for Aristotle a contradiction, a paradox, an impossibility. The "principle of non-contradiction" tells us that this statement is not valid.

With regard to the scenario (4): "there is neither cat which is an animal, nor cat which is not an animal," this means that the propositions (1) and (2) are both rejected, which, for Aristotle, is not possible (this is the "principle of excluded middle"): a cat must necessarily "be" or "not be" an animal, there cannot be a third position. In conclusion, for Aristotle, the four propositions of any tetralemma are incompatible with each other: only one can be true.

Let us now take an example taken from our subject of study, with the following tetralemma:

1. P: “the universe exists outside consciousness”
2. non-P: “the universe does not exist outside consciousness”
3. P and non-P: “the universe exists and does not exist outside consciousness”
4. neither P nor non-P: “the universe neither exists nor does not exist outside consciousness”

In statement (1), you will have recognized the realistic postulate and in statement (2), the idealist postulate. In an Aristotelian logic (from Aristotle), we only have the choice between realism or idealism, but we cannot marry them (contradiction) nor deny them both (excluded middle). However, we will see that for the Mādhyamika school, the logical approach is quite different. The tetralemma is neutral, entirely acceptable, everything is acceptable, there is no contradiction or excluded middle. It could be formulated like this:

“The universe exists outside consciousness, the universe does not exist outside consciousness, the universe exists and does not exist outside consciousness, the universe neither exists nor does not exist outside consciousness.”

And this is what is called the “middle way” or also “emptiness.” Emptiness therefore does not mean that there would be nothing, no phenomena, no Being, no universe. Emptiness means the suspension of all judgment, of all reasoning, of all thought, once one has formulated and well understood the neutrality of the tetralemma and the validity of all its statements. The middle way is that of the acceptance and validity of contradiction and of the excluded middle in the logic of Mādhyamaka.

It is said that a pilgrim once came to see the Buddha to ask him: “Does God (Atman) exist?” Buddha replied… nothing, he kept silent. It is not that Buddha could not answer or that he

was rude, but his silence was in itself an answer. Buddha might as well have solemnly declared:

"The Atman exists, the Atman does not exist, the Atman exists and does not exist, neither the Atman exists, nor the Atman does not exist."

And the pilgrim, on condition that he is capable of apprehending at once the totality of this series of statements, that he is capable of abstracting from it both the contradiction and the excluded middle, would have entered into "emptiness," into inner silence, the suspension of all thought. But it is likely that, faced with such a simplistic question, the Buddha decided that the neutralized tetralemma was inaccessible for this pilgrim and that silence was the most appropriate response (what a disciple of the Buddha must have explained to the pilgrim afterwards, we can hope).

Undecidability is the neutralized tetralemma, a tetralemma whose four statements are accepted (neither contradiction nor excluded middle) and all the metaphysics of Mādhyamaka is based on this undecidability. What is interesting is to see to what extent this undecidability has been recovered by modern quantum physics. Indeed, in quantum mechanics we speak of "superposition of states" to talk about the states of a particle, before we measure one or other of its parameters (speed, position, spin, electric charge, etc.). For example, the vector particle of the electromagnetic force, the photon, is in a superposition of wave-particle states.

A single experiment can admirably demonstrate this superposition[19]. If we pass a stream of photons through two fairly thin slits close to each other, on the screen beyond these slits will form, not two luminous areas, one for each slit, but fringes, alternating dark and light. These are interference fringes, because at the exit of the two slits, the light behaved like two waves which interfered with each

other. And, if at the same time a silicon plate is placed as a screen, the photons which will come into contact with this plate, at the level of the light fringes, will produce an emission of electrons in the silicon, that is to say an electric current. However, this photoelectric effect can only be explained if the light is a packet of photons, grains of light. This means that the same photons behaved like a wave to cross the slits and like grains, particles, to produce the photoelectric effect, once they reached the screen.

Is light then a wave or a particle? Physicists now answer this question by saying that it is a wave and a particle at the same time: a wave-particle. We do not know when exactly it is a wave, when it is a particle. It is both at the same time and it is its behavior, ultimately, that differs depending on the situation. Moreover, when we insist with quantum physicists that they explain to us what a wave-particle can really be, how we can imagine such an object, they cannot tell us anything about it. Or they can argue that the denominations "wave," "particle," and "wave-particle" are approximations, ways of speaking, that these terms should not be taken literally. In fact, at the macroscopic level of our daily life, there are light waves that interfere and there are indeed light particles that produce electric current in our solar panels, and in the photo sensors of our smartphones. But on a quantum level, these terms of waves and particles are irrelevant.

Finally, we do not know what this wave-particle quantum state or any other state of quantum superposition is. This superposition has no physical meaning until an obstacle is placed, such as a screen with slits or a measuring instrument. We also talk about Heisenberg's "uncertainty principle," which tells us that: we cannot know simultaneously the position and the speed of a particle. In fact, a quantum object cannot be exactly located in space (position) nor can it be exactly determined as to its energy (velocity). This uncertainty can still be found in the quantum cinematic

moment or in the time-energy relationship. Quantum mechanics confronts us here with undecidabilities, with wave functions and probabilities, rather than the certainties of classical mechanics.

In other experiments, we passed between two slits a so-called punctual photon, that is to say single[20]. This single photon also behaved like a wave: it passed through the two slits at the same time! But this statement "the photon passed through both slits at the same time" has no physical meaning, it is just a way of speaking, just like we say "wave" or "particle" or "wave-particle." As the famous physicist Dirac said, with a touch of humour[21]: "the *partiwave* has interfered with itself." Thus, and to return to the logic of Mādhyamaka, quantum physicists, just like the Buddha or Nāgārjuna, would agree well in saying:

"Light is a wave (and not a particle), light is not a wave (but a particle), light is a wave (and not a particle) and light is not a wave (but a particle), light is neither a wave nor a particle."

And such neutralized tetralemmas (all four propositions are acceptable, neither contradiction nor excluded middle) could be formulated for all quantum aspects of matter-energy. The mechanic quantum thus conceives the physical universe as a set of potentialities, only determined by probabilities, while abandoning in passing the Aristotle's logic. Here again, we are confronted with an "emptiness" of meaning and determination. This is how modern quantum physics joins Mādhyamaka, beyond the centuries, on the level of logic.

The Nagarjunian tetralemmas

With Nāgārjuna and the Mādhyamaka, Aristotle's logic and its principles of contradiction and excluded middle are abandoned. From now on, it is the neutralized tetralemmas that prevail: the four statements are accepted and one must

understand the whole in an intuitive way. In fact, the neutralization of the tetralemma can be done in two completely equivalent ways, either by affirmations, which we have seen so far: the simultaneous acceptance of the four statements; or by negations: the simultaneous refusal of the four statements. It is this second presentation that Nāgārjuna liked, because successive negations (in language, which is necessarily sequential), but simultaneous in logical intuition, are much more powerful than affirmations in bringing about the mental experience of emptiness. Let's see what this gives with the tetralemma of the relationship between the universe and consciousness:

1. Nor "the universe exists outside of consciousness."
2. Nor "the universe does not exist outside of consciousness."
3. Neither "the universe exists and does not exist outside of consciousness."
4. Neither "neither the universe exists outside of consciousness, nor does the universe exist outside of consciousness."

If we recall the assertions of other Buddhist schools, for Vaibhāshika, a realist school, "the universe exists outside consciousness;" for Sautrāntika, a school still tinged with realism, "a substrate of phenomenon-consciousness atoms exists outside of consciousness;" for Yogācāra, an idealist school, "the universe does not exist outside consciousness;" but for Mādhyamaka… it is the tetralemma of negations, above, which prevails.

Faced with theistic minds (who consider the existence of a divinity, of a God), the Mādhyamaka will say negatively: "Neither the Atman exists, nor the Atman does not exist, neither the Atman exists and does not exist, nor neither the Atman exists and neither nor the Atman does not exist."

Do things exist, is there a Being, an existent? Mādhyamaka answers: "neither Being, nor Non-Being, neither Being and Non- Being, neither neither Being nor Non-Being."

For Nāgārjuna, such tetralemmas of negations are destined to produce, in the one who hears them and seeks with concentration to understand them, to apprehend them, more with his intuition than with his reason alone, such negative tetralemmas are destined to produce a mental experience of vacuity, of emptiness. A stoppage of judgment, a suspension of thought. And, as such, for Nāgārjuna the tetralemmas themselves are superfluous and they should not even be formulated. Silence should be enough (remember the Buddha's silence in response to the question of the existence of God). The tetralemmas are used as an intermediate stage for the teaching of Ultimate Reality, for people who are not able to pass directly from silence to emptiness. The tetralemma can eventually lead them to emptiness, to their own inner silence.

Of course, from an Aristotelian point of view (which is the common point of view in our modern materialistic and realistic society), neutralized tetralemmas, in affirmation or negation, are sheer madness. And Aristotle himself concluded that a man who keeps silence has no more interest than a plant! Why continue to argue with a plant?

But, in fact, what can all this be used for?

The emptiness of the Phenomenal World

This section about tetralemmas was intended to familiarize you with this way of thinking of the Mādhyamika school. In fact, the tetralemmas are, for this Buddhist school, mental tools intended to produce the intuitive perception of emptiness. The tetralemmas are the provisional conclusions of the reasoning implemented in this school of thought. Provisional conclusions for the tetralemmas themselves will eventually be cast aside and reduced to emptiness. Now we

will examine how the Mādhyamaka leads its reasoning, its logic, to the tetralemmas.

For this, we are going to take the lunar scene again: you go out at night, with a friend, to contemplate the Moon. From this lived scene, we will finely analyze things, phenomena, in order to discover their foundations. Let us consider the Moon, since it is the object, the phenomenon, that your friend and yourself have come to contemplate. Naturally and automatically, you will perceive the Moon as a well-identified and defined object. In our modern, scientific age, everyone knows and you and your friend know that the Moon is not a big cheese hanging in the sky, but a satellite of the Earth, a ball of rock. Perhaps you are not knowledgeable enough to know how the Moon got there[22], but you know one important thing all the same: the Moon did not arise from nothing and causes produced its formation, its creation. Whether it is the "hand of God" (if you are religious) or more material causes, you know that the existence of the Moon is linked to the causes that produced this phenomenon. You also know that the Moon is not eternal and that the "hand of God" or cosmological and physical causes will eventually cause the Moon to disappear[23].

If you are not religious and you adhere to scientific conceptions, you suspect that all these chains of causes to form the Moon and eventually make it disappear take place over several billion years. This duration of the phenomenon, which greatly exceeds the duration of a human life and even that of all of humanity, gives the illusion of a permanence and therefore of a certain identity of our natural satellite. However, this is not the case: the Moon has not always existed, it takes its existence from causes and other causes will lead to its disappearance. The Moon is not eternal. Moreover, it is made up of atoms, of particles, which were formed in the heart of the star which is the Sun. These heavy atoms are formed by successive transmutations from lighter

atoms. The Moon is therefore not a consistent phenomenon, but a compound in constant transformation.

If the demonstration seems a little difficult to you, take a closer and more accessible phenomenon, such as a plant. Here too, a plant has no independent existence, has not always existed and will not always exist. Plants are, like all living things, in a perpetual process of becoming and in constant interdependence with the environment and, ultimately, the entire universe. These are cosmological causes which, starting from the birth of the universe until today, gave rise to our galaxy, then to our solar system, then to our planet, then to life on Earth. These are cosmological causes that can extinguish life on Earth as well (just consider the massive extinctions of living beings due to cosmic cataclysms, such as the impact of giant meteorites on our planet). However, without going so far, climatic conditions, pollution or simply the life cycle of the plant, can lead to its end. The plant is constantly evolving, depending on other phenomena such as rain, wind, nutrients and minerals that it will find in the soil. These phenomena being themselves causally linked to other phenomena in an infinite network of interdependences, there again up to the universe as a whole (these are cosmological conditions, causes, which make the Earth a planet capable of to welcome life, for the moment…).

You could thus take any other phenomenon, all phenomena, all come from causes which give rise to them and other causes will make them disappear. During their more or less brief existence, phenomena are not themselves objects with a certain identity, because they are composed of sub-phenomena (molecules, atoms, particles) which are subject to their own causality which conditions their appearance and disappearance. All phenomena are like a river which we may have the impression that it has a certain identity, because we have known it since our childhood, but which, in the end, turns out to be a permanent flow of water molecules and other dissolved or floating bodies.

The same is true of our identity as phenomenal "human beings." We are made up of approximately one hundred trillion cells, which share body space with ten times as many bacteria, microscopic fungi and viruses. Depending on their type, our cells are regularly renewed. Basically, our body changes about every fifteen years. From the infant, through the child, the teenager, the adult, the old man, our body also changes its appearance in a visible way. Our thought changes, evolves, as well as our personality, our character, our memory, our emotions. Accidental causes can suddenly lead to scarring, the loss of an arm, a leg… Admittedly, since our birth we have had a first and last name and fingerprints and a genetic code, the beautiful illusion! We are like all phenomena, a compound of sub-phenomena, which was born from causes and which will disappear as a result of other causes. We are in a total interdependence with our environment and all the cosmos finally (the next big meteorite will not spare us as a species, if we do not self-destruct before!).

Thus, already, at a simple materialistic level, the phenomena are not really consistent nor permanent. At this level of analysis, the Mādhyamaka does not even address the question of the existence of phenomena outside the consciousness that conceives them. Even for a realist, if he carries out a serious analysis of these hypothetical objects in themselves, he will agree that their identity is very problematic. For Aristotle, "a cat is a cat," "what is is," this is the principle of identity. The Mādhyamaka refutes this principle: there are no independent and certain identities. Phenomena, objects, things, are only compounds of other phenomena, objects, things, and all these phenomena, objects, things are related to each other, depend on each other, are the causes of each other. The Mādhyamaka is rather in agreement with the "principle of sufficient reason" of Leibniz: "never anything happens without there being a cause."

This interdependence of phenomena is called "conditioned co-production:" "co-production" because it is bundles of causes-phenomena that form each phenomenon and "conditioned" because each phenomenon depends on these causes-phenomena that give rise to it, that compose it, that make it evolve, transform it from moment to moment and, finally, lead to its disappearance. This is called the "emptiness" of phenomena. You will have understood that "emptiness" does not mean here that phenomena do not exist or that "nothing exists" (the famous nihilism stemming from Western misunderstanding of Buddhism). Emptiness, *Śūnyatā*, signifies the inconsistency of phenomena, their incessant becoming, their essentially composed of sub-phenomena aspect, and their ephemeral character.

If we take the phenomenon *X*: *X* is not *X* (it has no proper identity), because *X* has not always existed, because *X* has been produced by non-*X* (other phenomena which are the cause of *X*), moreover, *X* is composed of elements which, one by one, are not *X* and, in the end, *X* will disappear. *X* is only one part of a long causal chain. Replace *X* with anything, the reasoning is the same.

From a materialist point of view, scientific research on elementary particles fails to flush out THE fundamental particle. The intuition of the atom dates back to the highest antiquity. But it took until the 19th century for molecules to be discovered and the 20th century to really understand that they were made up of atoms. Then, during this 20th century, atoms were understood as consisting of a nucleus surrounded by an electronic cloud (of electrons). The nucleus itself is made up of protons and neutrons. Which, themselves, are composed of quarks. And we want to say "and so on," because going from the molecule (10^{-9} m), to the atom (10^{-10} m), to the atomic nucleus (10^{-14} m), to the neutron or proton and electron (10^{-15} m), finally quarks (10^{-18} m), we are still far from the Planck length (10^{-35} m) and there

is still a lot of energy to be deployed in particle accelerators to discover the most basic of elementary particles.

Thus, even at the level of phenomena as elementary as the particles constituting matter, we find the principle of conditioned co-production: the causal interdependence of the elements, their composition of sub-elements, their impermanent character. Here too, in the midst of molecules, atoms, particles of matter or mediating particles of forces, emptiness reigns.

To sum up, phenomena are the result of a dependent production, they are born of causes and conditions; phenomena exist in dependence on their components which are other phenomena. We perceive and conceptualize consistent, independent, identified, stable "phenomena" through a sort of mental habit, but this perception-conception is indeed basically an illusion. And you will probably understand better, now, a tetralemma from Mādhyamaka who tells us that:

"Neither phenomena are; neither the phenomena are not; neither the phenomena are and they are not; neither nor the phenomena are and neither nor they are not."

But these phenomena, co-produced and conditioned, by whom are they thought? What about consciousness in relation to phenomena? Are the phenomena the reflection of "things," external to consciousness? Or are consciousness and phenomena intimately linked?

The emptiness of the ego

For the Mādhyamaka, consciousness and phenomenon are interdependent, consciousness being considered as a phenomenon, an aggregate phenomenon of phenomena. This position is based on two arguments: 1) a phenomenological reduction which entails the principle that every phenomenon exists only in a consciousness which conceives it; and 2) a reduction to emptiness which entails

the principle that all consciousness is consciousness of some phenomenon (at least).

The phenomenological reduction

The first reasoning operated by the Mādhyamika school, the phenomenological reduction, was taken up in the 19th century by the existentialist metaphysician Edmund Husserl with his "transcendental epoché." The phenomenological reduction consists in reducing all phenomena to the contents of consciousness.

To do this, it suffices to take the phenomena one by one at the level of their sensory and perceptual results[24] and to reduce the sensation and the percept to the mental experience. Indeed, in the last resort, sensations and perceptions are actualized only in a thought, a mental state. There are no sensations or perceptions that are not an experience lived in consciousness. And, when we say that phenomena and consciousness are one, are a phenomenon-consciousness unity, we really mean that sensation-consciousness or perception-consciousness are unities, they are inseparable, they are the same thing. Any phenomenon-sensation is in a consciousness, any phenomenon-perception is in a consciousness.

Although in the teaching of Mādhyamaka the phenomenological reduction remains briefly explained, from what we currently know of the physics of the world and the neurobiological functioning of sensations-perceptions, it is possible to decline, for each of the six senses, a significant phenomenological reduction. Based on our "Moonlight" scene, we can formulate this phenomenological reduction as follows:

Vision: light photons from the sun take eight minutes to reach the Earth-Moon couple, bounce off the surface of our satellite and, in one second and half, reach the Earth's surface. There, they enter your eyes through the lens and strike the retina, forming a tiny image of the Moon there. The

retina is lined with photoreceptor cells which react to receiving a photon. This reaction consists of sending a sensory nerve impulse through the optic nerve which joins the back of the brain, at the level of the visual cortex. From there, your brain builds… a mental image of the Moon. A mental image means a perceptual thought, an awareness and the only experience you have of the Moon is therefore very mental. This purely mental experience of seeing the Moon ultimately applies to everything you can see: the landscape around you, your friend, your own body, the Moon, the distant stars, the entire visible universe.

Hearing: While you are looking at the moon, your friend says to you, "I too see the moon in the sky." Your friend thus produces a sound wave which is a series of periodic changes in the air pressure around you. These pressure variations enter your ears and cause your eardrums to vibrate. In the inner ear, these vibrations are transmitted and amplified by the ossicles, then the basilar membrane and ciliated cells which send sensory nerve impulses through the auditory nerve which joins the auditory cortices, on either side of the brain. From there, your brain builds… an aural representation of your friend's voice. It is therefore, ultimately, a mental experience, a thought, the proof being that in addition to the purely "sound" version of your friend's voice, you also have the mental experience of understanding information conveyed by this voice: you understand the meaning of what he is telling you. This purely mental experience of hearing your friend's voice ultimately applies to everything you can hear: the cries of a few animals in the distance, the engine of a car rolling down the hillside, a plane flying high in the sky, your own voice, the whole audible universe.

Smell: this moonlight scene taking place, say, on a beautiful spring evening, and in your garden, multiple smells hover around. Plants emit chemicals that diffuse into the surrounding air. These substances are drawn into your

nostrils each time you inhale. There they meet the olfactory mucosa which contains olfactory cells. When odorous molecules attach themselves to these cells, they send a nerve impulse through the olfactory nerve to the olfactory bulb of the brain. From there, your brain builds… a sensory map of each smell. The smell of your garden is therefore, ultimately, a purely mental experience and this goes for all the smells you could perceive in the universe. Like that jasmine tea you are drinking with your friend…

Taste: While gazing at the Moon in the night sky, you sip jasmine tea. Tea contains hundreds of chemicals in addition to the sugar you may have added to it. These substances, which are soluble in saliva, will activate the taste receptor cells that line the tongue and the palate (to put it simply). These cells send sensory nerve impulses to different taste nerve centers in the brain (to keep it simple). From there, your brain builds… a mental taste experience. The taste of jasmine tea in your mouth (it is known that this taste is also closely associated with the mental experience of smell) is therefore, ultimately, a purely mental experience and this applies to all taste sensations that you could perceive in the universe.

Touch: During this moonlight scene, a light breeze causes your shirt to flutter across your chest. This slight mechanical stimulation, moving tissue on your skin, exciting sensitive dermal cells which will react by sending a nerve impulse through different nerve fibers which all go back to your brain, in the somatosensory system. From there, your brain builds… a mental experience of touch. Whether it was the touch of a shirttail, the pressure of your friend's hand on your arm, the pain of a mosquito bite, the cool breeze blowing that night, finally, all these experiences of touch come down to a purely mental experience of contact with the universe.

Cenesthesia: you experience this moonlight scene in and from your own body. It is a kind of organic sensitivity,

produced from the synthesis of all the internal sensations and which give the overall feeling of existing as an individual. Internal sensory receptors send messages to your brain about muscle tension, sensations coming from your internal organs, such as general muscle tension that keeps you tall and straight, balancing on both legs against the force of Earth gravity the sensations of the movement of your arm to carry the cup of jasmine tea to your mouth and the weight of this cup, the internal sensations of the tea flowing through your esophagus into your stomach, the sensations of your intestines, those of your inner ears and the organs of balance when you tilt your head back to gaze at the moon in the starry sky, the sensations of cool air entering your lungs with each breath in, still maybe the sensations of your beating heart… All this cenesthetic information reaches the central nervous system: your brain. From there, your brain builds… a mental experience of your bodily existence. Indeed, for the whole of your body, of your somatic existence, so important because it is the basis of your sense of self, of being an individual, this whole experience is, in the end, purely mental.

The phenomenological reduction that we have just detailed for each of the six senses that make up human experience, clearly shows us that any phenomenon only exists in a consciousness that conceives it. You are reading these lines in a book. You may hear music in the background, you smell scents, you get up, you walk, you feel the ground under your feet, you can touch things, look out the window at the landscape, the clouds in the sky, the Sun. And from all of this you have a unified experience of exteriority opposed to interiority. A beautiful experience of consistent information which arrives from outside, to enter inside you and this opposition inside/outside reinforces you in the feeling of being an ego, organically and psychologically speaking, in a universe which is foreign to you, separated, independent. While the phenomenological analysis, on its

side, shows you that all this is only a mental experience, a beautiful illusion!

We could take by analogy the mechanism of reversal of the retinal image of our visual system. Take a magnifying glass and adjust its distance to a white screen to get a sharp image of what is in front of this magnifying glass. You will then observe that the image which forms on the screen is completely reversed: top-bottom and right-left. This is normal, since the light rays, which come from the scene in front of the magnifying glass, intersect in the center of the magnifying glass before forming an inverted image behind the magnifying glass. The same thing happens with our eyes: the light rays that come from the things we look at intersect in the center of the little magnifying glass that is our lens, so that on our retina an inverted image of the world around us is formed. However, "in our head," we see an image right side up! It is that an ultra-fast and automatic reversal mechanism of our brain puts the image right side up. We therefore have the "illusion" of seeing things right side up, whereas for our eyes they are upside down. By analogy, we can understand what the illusion of "exteriority" and the illusion of "ego" are: permanently a mental mechanism produces the illusion of a ego, in a body, itself in a universe, starting from a being which, itself, is reduced to be only an inseparable phenomenon-consciousness.

This is what Mādhyamaka calls the emptiness of the ego, this ego which exists in the illusion of exteriority-ego, but which no longer exists when this illusion is reduced to what it is: the pure flow of phenomenon-consciousness. We can formulate the tetralemma of the ego as follows:

"Neither ego, nor non-ego, neither ego and not-ego, neither ego nor nor non-ego."

Try to concentrate on this a bit: all this experience of you, there, and of the universe around you, is a reflex, an automatic translation because, at the base, what is, what

really is, this is an experience of consciousness, of thought, made up of all the sensations-perceptions-consciousness, the phenomena-consciousness. Try to live this, to feel it, forgetting for the moment the question of whether we are talking about the "consciousness of Jack Smith" (yours), forgetting for the moment the question of the other who also claims to be aware of the universe.

The phenomenological reduction brings us back to the pure flow of consciousness and hence other illusions can then appear. One can be dazzled by the solipsistic illusion: "I am Jack Smith (or replace with your own first name and surname), the only consciousness of the universe," as much to say that Jack Smith is God! Or else (this is transcendental solipsism), it is God who thinks the universe and my individual consciousness is a very small extension of God's one. Jack Smith "son of God" in a way, it is not better! But by reading what follows, concerning the reduction to emptiness, you will quickly come out of these too tempting and grandiloquent solipsistic illusions.

Reduction to emptiness

The second reasoning, advanced by the Mādhyamika school, is intended to thwart both those who decide to back down and renounce the emptiness of the phenomenological reduction on the pretext that it leads to solipsism (individual or transcendental) and those who, conversely, seem to revel in solipsism, imagining a creative divinity of the universe and the selves that inhabit it.

The reduction to emptiness is a kind of reasoning by the *reductio ad absurdum*, which Husserl also knew and which he called the "principle of the intentionality of consciousness," which tells us that all consciousness is "intentional," i.e. it is aware of something. In other words, a consciousness of nothing is no longer a consciousness, but nothing. To understand this and demonstrate it, we will carry out an inverse operation to the phenomenological reduction: we

start from the phenomenon-consciousness given by the first analysis (all phenomena are reduced to consciousness, they are even the same thing as consciousness) and we remove one by one all the phenomena out of consciousness to see what remains.

Let's start again from our famous moonlight scene. According to the Mādhyamaka, it is unclear "WHO" is aware of this (you, your friend, an Atman…), it does not matter, this scene nevertheless turns out to be, on analysis, a purely mental experience. So, let's start by taking the vision away from it. The Moon and eventually the whole universe disappears as… mental images. And since the images in memory can confuse the analysis here, let's say that we are in the case of a person blind from birth, who has never seen any image, neither of the Moon nor of anything else. This blind man will not even say that "it is black," because this blind man has no awareness of what vision or non-vision is, this meaning is "empty" for him, a non-information, a non-concept. The consciousness of the scene still persists all the same: one hears the friend talking and other sounds, one smells odors, one tastes jasmine tea, one feels the wind on the skin, the coolness of the night and everyone feels himself in his own body. OK, it rolls!

Now let's remove the hearing. The man born blind now becomes deaf, no more voice of the friend, no more animal crying in the twilight, no more engine of a car rolling down the hillside, of a plane flying high in the sky, your own voice has also died out and the whole audible universe has disappeared. And, always to simplify the reduction, we will say that it is a matter of someone deaf from birth, who has never heard anything, for whom the very concept of sound is non-existent. Nevertheless, for this blind and deaf from birth, the scene remains: the friend's hand on his arm, the wind on his skin, the coolness of the night, the taste of jasmine tea in his mouth, the smells of the garden and his

own body of which he has a diffuse awareness. It is still rolling!

Then, after seeing and hearing, let's remove the sense of smell from this moonlight scene. You or your friend are anosmic from birth: you have never smelled any odor and the very concept of odor is totally foreign to you. No more odors from the garden and plants release their chemicals into the air without you noticing. The awareness of the scene still persists, but in a very fragmented way, for now there is only the taste of jasmine tea in your mouth, the impression of the wind on your skin and the awareness of your own body.

After vision, hearing and smell, let's now remove taste: you and your friend have been suffering from ageusia since you were born. The very notion of "taste" does not exist for you. The jasmine tea is gone, all that remains is the warmth and mechanical consistency of water in your mouth, the feel of the wind on your skin, and the awareness of your own body.

What is still left of this scene, after removing vision, hearing, smell and taste? Touch? Let's then remove the touch, which makes the feeling of the air flowing over your face disappear, its temperature, you no longer feel the shirt caressing your chest while floating in the wind. You no longer feel your friend's hand on your arm. Your clothes are gone, just like the sandals on your feet. No need to run your hand through your hair, sound out this or that around you or even your own body, you have been anesthetic since birth and the sense of touch has no meaning for you. What is left? Awareness of your own body.

So, to finish, let us withdraw cenesthesia itself. Remember that cenesthesia is the totality of sensations coming from all points of the body. As touch has been removed, nothing comes from the surface of the skin or from deeper mechanical tactile sensations. Not only do you no longer feel the sandals on your feet, but your feet themselves have

disappeared, just like your legs, your arms, your head, all your muscles! Gone are your mouth, your esophagus, your stomach and the hot water of jasmine tea. Your belly, your intestines, your lungs, your heart are gone… You no longer know if you are standing, sitting or lying down, if your head is up or down, if you are moving or not, if you are on the move or motionless. And to perfect this imaginary experience[25], from birth, cenesthesia does not exist for you, so that you have absolutely no notion of what your own body is. From there, it remains difficult to imagine that you still have any notion of "me." Do you still exist, when what founds the feeling of proper existence is the cenesthesia of the body?

Once we have taken it all out, what is left of the phenomenal moonlight scene? Nothing! Is there a state of consciousness? As we assumed deficiencies from birth, there is also no memory to represent a color, a form, a sound, an odor, a taste, a touch, a body. Neither experience in the present moment, nor memory of the past, consciousness has lost all its content. Is there then consciousness left? Nope! Nothing! Nothing can remain.

This is all the more so as we have been able to understand the identity between phenomena and consciousness, the self. Consciousness is made up of all the phenomena that occupy it and each phenomenon exists only in this consciousness (phenomenological reduction), but again, by removing all the phenomena that occupy a consciousness (reduction to emptiness), we do not get an empty consciousness, but an emptiness of consciousness, the disappearance of consciousness, the annihilation of the ego.

Self-consciousness is indeed a phenomenon, in the sense that self-consciousness is interdependent with all phenomena: the universe exists for a consciousness and consciousness exists for the universe. Self-consciousness is all the same a rather special phenomenon, since it is a

phenomenon that connects, groups together, seems to "read" other phenomena. It is a sort of aggregative metaphenomenon of phenomena. And, in doing so, the self-consciousness generates an illusion of exteriority and corporeity: I am a body that perceives an external universe to itself, through a nervous system, a brain.

Both reductions made by the Mādhyamaka show us all the emptiness of such an impression of exteriority and corporeity. Mādhyamaka, using its usual tetralemmas, posits both what is (the various illusions: of the phenomena, of the external world, of the body and of consciousness) and what is not (the other side of illusions), proposing to remain on the undecidability of each tetralemma. Here are these tetralemmas:

"Neither phenomenon, nor non-phenomenon, neither phenomenon and non-phenomenon, neither neither phenomenon nor non-phenomenon."

"Neither external world, nor non-external world, neither external world and non-external world, neither external world nor non-external world."

"Neither body, nor non-body, neither body and non-body, neither neither body nor non-body."

"Neither consciousness, nor non-consciousness, neither consciousness and non-consciousness, neither neither consciousness nor non-consciousness."

As for the individual and transcendental solipsisms, they disappear with the tetralemmas. Also, after having considered the illusion of consciousness and phenomena, of the body and of the ego, the mystical experiences of feeling "God," the "consciousness of God" (the transcendental ego, the *Alayavijñāna*) or even a part of the consciousness of God (the individual ego, "son of God" in a way), are these experiences, too, illusions and do not stand up to Mādhyamika logic. Solipsism is well only an intermediate

stage, an ultimate illusion. It should neither frighten nor lead one to renounce analytical reductions in order to remain confined to materialist realism. Phenomenological and to emptiness reductions smash both materialistic realism and solipsism. Emptiness remains. But emptiness itself…

Emptiness of the emptiness

To paraphrase Ecclesiastes, one could say: "emptiness of emptinesses, all is emptiness." For all this metaphysical thinking, whether it be those of the Vaibhāshika, the Sautrāntika, the Yogācāra or the Mādhyamaka, whether they be analyzes as to the emptiness of phenomena, as to the emptiness of consciousness, the emptiness of the ego, the emptiness of consciousness-sensations or consciousness-perceptions, the emptiness of one's own body, all of this ultimately takes place in a consciousness, whether it is that of the Buddha himself, of Nāgārjuna, of the *Alayavijñāna*, of God, that of your friend in the moonlight or even your own consciousness. Ultimately, the whole theory and experience of emptiness reduces itself to a fact of consciousness and is itself subject to various tetralemmas which empty emptiness itself of all content.

The Prajñāpāramitā texts do nothing other than show and affirm (in fact, they are successive negations) this emptiness (*Śūnyata*) of emptiness, the *Śūnyatiśūnya* (pronounced *shoo-nıa-tɪ- shoo-nıa*), which can be translated as the void of the void, the nothing of nothing. If we exercise a rigorous analysis on being, on what is, on ourselves and on the phenomena among which we evolve, until now all that seemed to us realistic, stable, durable, in a charming duality between the universe and ourselves. But, in the end, we realize that all this has no more reality than a dream. However, this dream itself eventually evaporates with everything else, because the dreamer and his dream are linked by their common emptiness. We have to move from relative truth (the conditioned co-production of phenomena

and the ego), to absolute truth, the *Śūnyatiśūnya* of Prajñāpāramitā.

The Prajñāpāramitā, which is considered the most sacred Buddhist text, the highest teaching of the Mādhyamaka school, has more than one hundred and twenty-five thousand sections. However, there are many summaries that generally serve as a support for meditation. We will use one of these summaries (the Tibetan version) to explain to you what the emptiness of emptiness is. However, the word "explanation" may not be very accurate. Because here, more than elsewhere, we are going to ask you to appeal to your intuition rather than to your reason, your rational intelligence. Nor is it a question of "believing" in Prajñāpāramitā, as if it were a religious belief or a superstition. You must simply strive to understand intuitively, let the very meaning of this text slip into your mind.

It is therefore not an understanding based on an effort of acquisition, but an understanding based on an inner stripping, an intellectual surrender, an entirely intuitive openness. We "feel" Prajñāpāramitā, more than we really understand it. *Śūnyatiśūnya* can only be attained by a mind that is stripped and free from ignorance and illusion (i.e. whitch has fully assimilated the various emptinesses: phenomena, consciousness, ego, etc.), which went beyond all representations, conceptions, born within the mind itself. And it is this inner emptying, this surrender, which is accompanied by the surrender of emotions, reactions and desires, which is called emptiness of mind or enlightenment of mind.

In the Mahayana Buddhist tradition, one of the most famous summaries of the Prajñāpāramitā is presented in the form of a scene, which brings together, in addition to an assembly of disciples, the Buddha himself and two of his most famous disciples: Avalokiteśvara (pronounced

avalokıteshvara) and Śāriputra (pronounced *sharıpootra*). All were gathered on Mount Vulture in Rājagriha, in the Patna district of India.

Both the Buddha and Avalokiteśvara were in a state of meditation. After a while, Śāriputra asked Avalokiteśvara a question[26]: "Great disciple, how can a follower, who wishes to practice the profound teachings of Prajñāpāramitā, understand them?"

Avalokiteśvara, from the depths of his meditation, answered him in this way: "Behold, Śāriputra, how a follower, eager to practice well the teachings of Prajñāpāramitā, must understand them:

"The body, the sensations, the perceptions, the thoughts and the consciousness, must be understood as entirely Emptiness.

"the phenomena which appear in thought are the Void and the Void is the phenomena which appear in thought; neither phenomena nor the Void can be separated nor phenomena be anything other than the Void.

"It is the same with the sensations, the perceptions, the feelings, the desires and consciousness which are the Void.

"So, Śāriputra, all things are Emptiness, they have no beginning or end, they have no particular characteristics, they have no substrate that would make them exist on their own.

"Śāriputra, given this, Emptiness itself is not phenomenon, is not sensation, is not perception, is not feeling, is not desire, is not consciousness. In other words, the Void has no sight, has no hearing, has no

smell, has no taste, has no touch, has no body, has no spirit, has no phenomenon, has no quality.

"Where there is no vision, there is no desire to see; where there is no hearing, there is no desire to hear; where there is no smell, there is no desire to smell; where there is no taste, there is no desire to taste; where there is no touch, there is no desire for contact; where there is no body, there is no desire to be an embodied being; where there is no consciousness, there is no desire for consciousness and there is also no consciousness of desire.

"So, Śāriputra, as there is no consciousness, there is no illusion, nor victory over illusion; there is no suffering nor freedom from suffering and there is also no sickness, nor old age, nor death and there is no battle to be won against sickness, old age or death.

"In the same way, there is no good or bad; there is nothing to add or take away; there is no illusion and no exit from illusion; there is no way of error nor Path to follow away from error; and if there is no Path, there is no one on the Path; there is no folly or Wisdom; there is nothing to achieve or not achieve.

"Thus, Śāriputra, all this also applies to Bodhisattvas[27], who see that *Nirvāna* and *Samsāra*[28] are the same thing: that there is neither *Nirvāna*, nor non-*Nirvāna*, nor *Samsāra*, nor non-*Samsāra*. These have given up the desire to achieve anything.

"This is how, Śāriputra, Prajñāpāramitā should be understood."

After having thus spoken, the Buddha himself undoubtedly opened an eye to declare three times: "It is well said." And he added: "So it is: Avalokiteśvara has described the profound Prajñāpāramitā, which

must be understood in this way. All the Buddhas are satisfied with this explanation."

Prajñāpāramitā, the emptiness of emptiness is important to understand well… intuitively, because it will save you from an ultimate, but no less important illusion: nihilism. Because after having reduced everything to emptiness: the phenomena, the body, the sensations, the perceptions, the ego, the thought, the consciousness itself, some may be tempted to take this void, this emptiness seriously, and to make it something quite substantial, a beautiful doctrine, a formidable theory, something that would basically say: "everything is void, nothing exists, let's draw the consequences of that." Which can lead to going out in the street to kill people (after all, is not everything just an illusion?!), even leading to suicide (since everything is void, life no longer has meaning) .

Another version, let's say "mystical" of this ultimate illusion, consists in maintaining a last duality, that between *Samsāra* and *Nirvāna*. *Samsāra* is seen as the illusion to be fought and *Nirvāna* as the state to be attained, a kind of paradise. This can lead to renouncing everything, to living in the strictest asceticism, to practicing meditation almost continuously, withdrawn from the world and from society, to becoming a kind of vegetable or jellyfish, slumped at the bottom of a cave.

The Buddha, just before his Awakening, went through this path of error: for three years he practiced meditation and yoga without interruption, eating only one grain of rice a week (says the legend). In the end, on the verge of vital exhaustion, this was a young peasant woman who pulled him out of his illusion. She managed to overcome her fear on seeing this hermit yogi who looked like a demon and began to talk to him. She offered him water from the river and some

fruit. Later, filled with compassion, she returned to bring him more food and began to sing him songs.

What happened to the future Buddha, the one who was to become the Awakened, is that the voice of this young woman and the rich foods he absorbed, far from taking him away from his quest for the absolute, greatly improved his condition and his meditation. The energy, the emotions, the feelings, perhaps the desires, which resurfaced in him, increased tenfold his capacities for mental discrimination. We then speak of his fight against the "ten armies of Māra." The young peasant woman and her food had awakened in him a number of desires and passions that were in complete contradiction with the ascetic life, both bodily and mental, that he had been living for three years. But instead of being grieved by it, the Buddha succeeded in interiorly going beyond all that and understanding that the nature of *Samsāra* is the same thing as the nature of *Nirvāna*. From then on, he no longer made a distinction between the two, he was no longer afraid of his desires and passions and finally attained enlightenment. Subsequently, he definitively abandoned the life of an ascetic, considering it an illusion, and set out on the roads of India to teach, as a Bodhisattva.

If we remained with this ultimate illusion, our work would end there: we would perhaps have convinced you to go to rot in a cave or to commit suicide illico presto. Or worse, the reader might feel deluded and think that all this nihilism is madness and that it is better to forget all about it and go back to everyday life.

It is told that one day, the great Tibetan master Marpa lost his only son. Needless to say, the master was very saddened by the loss of this child. These disciples, to whom he had taught Mādhyamaka and Prajñāpāramitā and that "all is illusion," were very affected to see their master thus demoralized. All their certainties were being shattered: where is the truth?

One day, one of the disciples dared to confront the master and asked him this question: “O, revered master, we can clearly see that you are affected by the death of your son. But does not your Wisdom teaching say that attachment to all things and all beings is an illusion? And is not the loss of things or beings then an illusion?” And he humbly waited for the answer. Marpa answered him exactly this: “O, zealous disciple, you are perfectly right, my son’s death is an illusion… but it is a *great illusion*!” and the disciple understood by seeing, both the tears and the smile of his master, what he meant, remembering then the identity between *Samsāra* and *Nirvāna*.

Marpa was also a great master, he is one of the main masters of the Tibetan Kagyu school. His master in India was Naropa (among others) and his most famous disciple is Milarepa[29]. Marpa was an awakened being, but also a being deeply rooted in the world. He was a translator of Buddhist texts from Sanskrit to Tibetan; he managed a large farm with many servants; he looked after a school of disciples; he could become a doctor or a judge on occasion. Today, he would have three doctorates, be a lawyer, doctor, university professor and businessman all at the same time. You cannot be more in touch with the world than Marpa. Yet he was also a very detached man inside, who fully understood the deep meaning of emptiness and the emptiness of emptiness. His son’s death was a “great illusion” which affected him greatly, for even though phenomena are illusions, even though everything is reduced to consciousness and consciousness to emptiness, Marpa was not an amorphous, autistic vegetable.

Understanding illusion does not make us escape living in illusion. There is a body, a brain, surrounding phenomena, attachments, desires, disappointments, afflictions. But for those who have attained the Wisdom of Prajñāpāramitā, it is possible to live all this, to live this illusion, while also keeping an anchor in discernment.

This is the very meaning of Prajñāpāramitā, of the deep recognition of the complete identity between *Samsāra* and *Nirvāna*, the deep understanding of *Śūnyatiśūnya*. So, we act without looking for the fruit of actions, we take things, situations, beings, one by one, for what they are at the present moment. If there are sufferings to be endured, we endure them, if there are pleasures to be experienced, we experience them. If we have to do the dishes, we do the dishes. If you have to unclog the sink, unclog the sink. The death of a child is a loss, an affliction, a suffering, but it is also a great illusion, an opportunity to go beyond certain things in oneself, to live something else, differently. This loss then becomes a beacon on the Path of Wisdom.

In the Bhagavadgītā[30], one of the fundamental texts of Hinduism, probably written between the 5th and 1st centuries BC.[31], the right attitude, in the face of emptiness, is amply exposed in an edifying dialogue between Arjuna, who has to fight against members of his family who oppose him, and Brahma (God) who appears to him in the form of Bhagavat or Krishna, a deity.

We are in a situation of war between two related clans. Arjuna then finds himself in a painful inner conflict: he must give the signal for the battle which, inevitably, will lead to the death of a large number of members of his family.

However, this whole story of intra-family conflict is a metaphor and should be understood as such. It is the figuration of the inner duality (the two clans of the same family), which produces the conflict of the mind with itself. This story is therefore the representation of the inner journey, of duality, towards Wisdom, the understanding of the right path, of inner detachment.

Throughout the text, Krishna will constantly explain to Arjuna that all suffering results from the agitation of the mind around desires. From there, the only way to still the mind is a set of disciplines and renunciations, the yogas:

devotion to a personal God, metaphysical knowledge, right action in the world, and meditation.

Throughout the text, Arjuna explains his scruples, his guilt, his suffering, having to fight his relatives and kill them. And, in answer, Krishna does not stop showing him that these enemies are only illusion and that in the end, by killing, he will not kill anyone. As we are in a metaphor, this is not an encouragement to go to war, but the idea is that the enemies within, especially desiring thoughts, are illusory and it is possible to destroy them. At the same time, Krishna's message is that it is just as illusory to renounce all action as to plunge into action indiscriminately. The message which is constantly repeated by Krishna throughout the poem is this: "You are led to act, but nothing obliges you to enjoy the fruit of your actions. Act therefore without pursuing the result of your actions, whether there is success or failure. Do not give up on the action either."

We therefore find, in the Bhagavadgītā, this anti-vegetable position: understanding and fully living emptiness is not about renouncing the action, nor even desires. For this renunciation (which would be asceticism, death, suicide or madness) is itself an ultimate illusion, a formation of the ego: it is the ego that renounces everything! Emptiness must apply to renunciation itself: renunciation must be renounced. A tetralemma is welcome here:

"Neither renunciation, nor non-renunciation, neither renunciation and non-renunciation, neither neither renunciation nor non-renunciation."

True emptiness, well understood and acted out, embodied, consists in doing what must be done in the present moment, while remaining inwardly in true detachment: one does not renounce action, but one renounces the results of action, one renounces desire. And even still, this renunciation of results and desires does not in any way mean that there are no more results of actions that count, nor desires to have. This means

that the result of actions and desires (only your intuition will allow you to understand what will follow) can be experienced, but in inner detachment.

The Brahman's net

The "Brahman's net" (Brahman being, in the Hindu religion, the supreme self, the cosmic soul, from which flow all things and individual souls) is a metaphor of the Buddha to mean how those who have points of mistaken views on emptiness are caught like fish in a net. The net of Brahman refers, at the same time, to one of the major metaphysical errors: the belief in a supreme self.

The Brahmājālasūtta, the Brahman net sūtra (sacred text), attributed to the Buddha, presents the sixty-two ways of being mistaken, of having erroneous reasonings and conceptions concerning, for example, infinity, the universe, causality, the ego, the supreme self, the ego after death…

As it would be tedious and repetitive to repeat these sixty-two errors here, we will more simply follow a grouping into twelve categories and draw a summary, each time giving a brief explanation of the origin of the error itself (which is not done in the Brahmājālasūtta, which is limited to a simple presentation of the errors, without further explanation). In these misconceptions, you will find most of the philosophical, metaphysical or religious beliefs that have run in the East as in the West.

The ego and the universe are eternal

Buddha denounces first of all the "eternalists" who claim, by means of meditation: to remember their past existences, to remember even the cycles of expansion-contraction of the universe. These people regard the ego and the universe as eternal, and beings are only born, die, reborn, eternally, from life to life, from cycle to cycle of the universe. In fact, for the person freed from these false conceptions, the eternity of the universe and of the rebirths are only figments of the mind. So

the way to emptiness is not to consider these things, to detach from them.

There is a creator who engenders ephemeral creatures

Buddha then denounces a metaphysical conception which consists in saying that: during a phase of expansion of the universe, a being is reborn; then, this being, tired of being alone, creates other beings (by rebirth); in fact, the first being then takes himself for the supreme creator and the other beings consider him similarly for their creator God: one is powerful, omniscient and eternal, the others are weak, limited and mortal. Here again, for the person freed from these false conceptions, this hierarchical conception between a supreme self which creates limited and ephemeral selves, is only a view of the mind. So the way to emptiness is not to consider these things, to detach from them.

There is eternal gods and mortal humans

Buddha then evokes these erroneous conceptions which consist in imagining gods who exhaust themselves in the paradisiacal life or who lose their minds because of a form of jealousy towards other gods. These weaknesses lead them to fall from their divine status and be reborn in human form. So there are gods not corrupted by pleasure or jealousy who remain eternal and corrupt gods who become mortal men. For the person freed from these false conceptions, this idea of a hierarchy between divinities and men and that the latter would be fallen divinities, is only a view of the mind. So the way to emptiness is not to consider these things, to detach from them.

The body is mortal, but mind is eternal

Buddha denounces here a purely intellectual conception which consists in saying that: the body and its sense organs are not eternal, they are mortal, while the mind, the consciousness, represents the permanence, the stability and the eternity of the ego. For the person freed from these false

conceptions, this idea of a duality, dichotomy, differentiation, between the body and the mind, one mortal, the other eternal (the eternal soul of religions), is only a view of the mind. So the way to emptiness is not to consider these things, to detach from them.

The errors concerning the universe

The Buddha shows that some think the universe is finite, contained in a sphere; that others think that the universe is infinite, without limits; that still others consider the universe both finite and infinite; finally, others think that the universe is neither finite nor infinite. For the person freed from these false conceptions, the question of the finitude or the infinity of the universe is a false question and all the answers that we can bring to it will only be views of the mind. The path of emptiness therefore consists in not considering the qualities of finitude or infinity of the universe, in detaching oneself from them.

The ego and the universe appear and exist without cause

Buddha denounces here the stochastic conceptions as to the origin of the ego and the universe: so and so will say that before existing he did not exist, passing from the state of non-existent to the state of existing and that there is no cause for this passage which simply depends on chance. And similarly, another will say that the universe itself came into existence out of nothing, without any cause, by chance. For the person freed from such misconceptions, the doctrine of non-causality does not stand up to the perception of the endless chain of phenomena and of the thoughts and desires that constitute the universe and the ego. Non-causality is only a view of the mind. The path to emptiness therefore consists in not considering the conceptions of non-causality and chance, in detaching oneself from them.

The errors regarding the conscious ego after death

Buddha also discusses the various, often contradictory, conceptions of the ego after death. This is how some think that after death the ego persists and is conscious. From there, the ego is conceived sometimes as material, sometimes as immaterial; or else, both material and immaterial; or even neither material nor immaterial. The ego can also be conceived as finite or infinite; or finite and infinite; or again neither finite nor infinite. The ego can experience a single state of consciousness or several states of consciousness; limited or unlimited states of consciousness. The ego can, after death, find itself totally happy or totally unhappy; or else both totally happy and totally unhappy; or neither. For the liberated person, such conceptions about the ego after death are only figments of the mind. The path to emptiness is therefore not to consider these conceptions about the ego, to detach oneself from them.

Errors concerning the unconscious ego after death

In the same way, the Buddha questions all conceptions about the ego after death, considered as persistent, but this time in an unconscious way. From there, the same arguments are denounced concerning its materiality or immateriality, its finitude or infinitude. For the liberated person, such conceptions about the ego after death are only figments of the mind. The path to emptiness is therefore not to consider these conceptions about the ego, to detach oneself from them.

Errors concerning the neither conscious nor unconscious ego after death

The Buddha similarly denounces conceptions that consider the ego after death as neither conscious nor unconscious, but still persistent. According to conceptions, it can then be material or immaterial; both material and immaterial; neither material nor immaterial. It can still be

finite or infinite; both ; or neither. For the liberated person, such conceptions about the ego after death are still only figments of the mind. The path to emptiness is therefore not to consider these conceptions about the ego, to detach oneself from them.

The ego is destroyed with the body

Buddha denounces the opposite conceptions, which consist in seeing the ego as material, composed, as we would say today, of energy matter, atoms, molecules. This ego, essentially related to the body, appears with the body at birth and disappears with the body at death. For the liberated person, the conception about the ego that disappears after death is only a figment of the mind. The way to emptiness is therefore not to consider this conception about the ego, to detach oneself from it.

The ego reaches the Nirvāna here and now

The Buddha also denounces various doctrines which present the relationship of the ego with Nirvāna. For some, Nirvāna is attained by the ego enjoying here and now the pleasures of the six senses. But as the pleasures of the senses are ephemeral, relative, never satisfied, Nirvāna is rather reached by the detachment of the sensual pleasures, to enter in states of mental concentration, here and now. However, as these states of mental concentration do not make thoughts which carry emotions, which can be negative, disappear, Nirvāna is reached by the ego which concentrates on the void of thought, here and now. However, even in this state of detachment and concentration on emptiness, the rapture itself is too much, so that true Nirvāna is attained through equanimity (equal-mindedness, detachment bearing on rapture himself), here and now. However, for some, this detachment from delight is, itself, too much because it is the source of a certain joy. True Nirvāna therefore consists in detaching oneself from the joy of detachment, fully conscious, here and now. For the person freed from any

conception of the relationship of the ego to Nirvāna, all these ideas are only figments of the mind. The path to emptiness therefore consists in not considering these conceptions about ego and Nirvana, in detaching oneself from them.

Speculation about the future

Finally, the Buddha denounces all conceptions concerning the future, such as the reincarnation of the ego in another body; the merits or demerits that will influence the choice of the next body and the next living conditions for reincarnation; conceptions concerning the conditions of the cessation of reincarnations or even those who claim that for certain great meditators and deserving people, reincarnation can be freely chosen, etc. For the person freed from any conception of ego in the future, all these speculations are only figments of the mind. The path to emptiness is therefore not to consider these speculations about the ego in the future, to detach from them.

In summary, all the philosophical, metaphysical or religious conceptions that the Buddha denounces, take birth in a consciousness, these are "views of the mind." Basically, it is just imaginations, sweet daydreams, nothing more! They therefore line up alongside phenomena and their sensory and perceptual extensions. For each of these misconceptions, one could produce a tetralemma of undecidability, to express things from the angle of emptiness, the *Śūnyatiśūnya*, the emptiness of emptiness. The Buddhist teachings also speak to us of "inseity", the "*tathāta*", the fact that it is so, things are what they are and nothing beyond, outside of all duality. From this point of view, the opposites are maintained, side by side, without mixing, without annihilating each other, without melting. Rather than the confrontation of points of view, of conceptions, *Śūnyatiśūnya* is a suspension of any conception, an inner, conceptual, intellectual surrender. This surrender being in continuity with the abandonment of conceptions concerning sensations, perceptions, the body

and consciousness, the ego. In continuity with the abandonment of all conceptions concerning the universe, materiality, things in themselves (noumena) or phenomena.

The Tathāgata is one who follows this path of *tathāta*, of suchness. And this is fundamental for our subject, the idea of changing universe. Already, in the first chapter, we insisted on the necessity of detachment in order to be able to produce the *Ish*, the quantum leap, from one universe to another. We see here that it is also important to detach from many erroneous conceptions, which attach us to this present universe and prevent the jump. All this talk about the Mādhyamika school and its teachings, undecidability, tetralemmas, emptiness of the phenomenal world, emptiness of ego, emptiness of emptiness, Prajñāpāramitā and *Śūnyatiśūnya* and the net of Brahman, all this is intended to create in you a philosophical, metaphysical, even religious stripping, in order to be able to generate the *Ish* of the leap between two parallel universes.

In the first chapter, we explained to you the right attention, the perfect meditative state of mind to produce the leap. But here, in this second book, we explain to you these misconceptions that prevent the leap and how to get rid of them, to move away from them, to let go of them, to abandon them. How to remain at the center of all things, of all conceptions, without moving the mind, without letting it be attracted by one view of the mind more than by another?

Buddhism, you will understand, does not ask you to become vegetables, to stop working, to abandon your family, to become a monk or ascetic or even to commit suicide. All these attitudes and behaviors of a so-called “surrender” are also, in a way, paths of error. Buddhism tells you, on the contrary, to continue like this, to take things that way, to go with the flow, to not oppose yourself. It is therefore not a question of rejecting desires on the pretext that they are illusions, fantasies and lead to suffering. This is true, but it is

about desires held in the attachment to desires. And to renounce desires is to generate mirrored desires, desires of anti-desire! Desires are legitimate, they are the creativity of being, but they must be apprehended in detachment. Thus, you can consider "changing universe," provided that this desire is generated in letting go, in suchness. This is the true teaching of the Buddha.

Desires experienced in attachment to desires are like a river in which one is plunged and carried away. Desires experienced in detachment, in letting go, are like a river, on the banks of which we sit.

The three great impediments

The three main impediments to changing universe are emotions, desires and beliefs, because all three are the powerful means of attachment to this universe, the one in which you live. It is therefore important to know well and understand well the teachings of Mādhyamaka and the errors of conceptions (which lead to beliefs), such as they are described in the "net of Brahman." Let's see in detail these three impediments and how to avoid them (when possible…).

The emotions

Emotions are lively, shimmering, colorful, fascinating, marvelous or atrocious, in any case, they occupy the mind well… and the body which is both the source and the manifestation of them. Emotions without detachment literally hook the person to the universe, by the ignorance of the reality that they produce, by the preoccupation of the mind, by the reactions and behaviors that they involve. Emotions are like the music to the movie of your life, they carry you away, manipulate you, seduce you or revolt you, but they never let you rest.

If, after reading the first chapter, you realized that your emotions, in addition to occupying your daily life, were also a

hindrance in the practice of meditation, you must have understood to what extent they are an impediment. As they swirl past your mental gaze, your mind is so taken over that you forget even the basic technique (e.g. breath awareness). Emotions are accompanied by mental films, fantasies, which are the manifestations of desires and which prevent the attainment of *Ish*. The state in which you could switch to another universe.

The five main emotions are love, hate, joy, sadness and fear. Each contributes in its own way to our clinging to this present universe and hinders all possibilities of making a leap into a different universe. For example, you love someone who does not love you back. You would like to jump into a different universe where this love would be reciprocal, shared. To do this, it is necessary to renounce this love in this universe. For as long as you persist in loving the person emotionally, in this present universe, no leap can occur, for your love is an attachment to this present universe.

You are going to say: "But if I give up loving this person, then why would I want to take the leap? And if I do not want to take the leap, why would the leap happen?" Indeed, seen from this angle of the duality "love/not love" (presence/absence of emotion), the teaching may seem paradoxical, contradictory. But if you formulate a tetralemma of your love for this person, the contradiction and the paradox will disappear:

"Neither love, nor not love, nor love and not love, neither neither love nor not love."

What does this tetralemma actually mean? You are *A* and you love *B*, *B* who does not love you back. In this situation of frustrated love, there is clinging to this existential situation, to this version of the universe. In fact, it is the inability to renounce love for *B* that maintains this version of reality. You are convinced that your love will disappear if you give it up, which is a mistake. Or, if your love vanishes so easily, it is

understandable that the other, *B*, does not react positively to it (and you cannot leap into another universe). Such love may occupy your mind with picturesque emotions, but it remains superficial and unstable.

Now, love can survive renunciation. Take the situation where you had to leave a childhood friend, because your life paths had to separate when you became adults. Each on your side you will follow your path. Perhaps you will maintain contacts by letter, email, telephone and one or two meetings per year. Maybe not. Perhaps you will lose sight of each other, because both of you will be completely caught up in the whirlwind of life. But, ten years later, in an airport hall, by chance, you meet this friend again. There is a good chance, if your friendship was a real friendship, that you will both quickly find your emotional marks. Your friendship had not disappeared, despite the distance, the absence and the passage of time. It is the same with the love for our children who grow up and leave the house. It is the same for a love of youth. The same goes for the love of *A* for *B*. If it is real love, felt in trust, then you can put it on hold and train yourself to take the leap… into another universe!

The lack of trust is to believe that love is dependent on contact, the telephone, the meeting, the reciprocal love of *B*. Conversely, trust is to conceive this love as independent, a datum that transcends phenomena, a divine love, practically. Your love for *B* must be an absolute love, a mark in your heart, like a scar or a tattoo that will not come off with the first wash with soap. Once this love is anchored in trust, then you can detach yourself from it, hide it from the bottom of your heart, like a secret talisman. And it is in this state of detachment for *B* that the leap into a parallel universe will have some chance of occurring. So, if that love is truly sincere and trusting, it is possible you will reach that version of reality where *B* loves you too. You have crossed the infernal plain, without looking back at the cries of your amorous emotion and the loved one has not changed into a statue of

salt. In practice, in this situation, or in similar situations, you can evoke your love, *B*, to your consciousness, then, immediately afterwards or almost at the same time, you concentrate on the tetralemma above, until you feel it deeply. Then you let go and let yourself rest in the mental condensation, without any further effort.

The other side of love, hate, is also a very captivating emotion that hangs very well on the present universe. Just like love, it is often "blind" in the sense that it takes away the understanding, obscures the intelligence, leads to intense affective reactions and often exaggerated behavior. Hate can invade the mind to the point of making the hater sick. It can lead to desires to hurt, to destroy the other, to see him disappear. It can also lead you to suicide, which is not better.

If you succumb to hate, you are not about to change universe! But what is more, if you persist in your hate, you may one day change universe, but it will not be the right one. It could be a relatively hellish universe where you will painfully experience the consequences of your hate. In this sense, hate is always a dangerous emotion and basing your desire to change universe on hate is very risky for you.

As much as love simply requires a detachment, so much hate must be transmuted, to no longer produce an obstacle to the change universe. For that, two mental operations are necessary: the stopping of the fantasies consequences of hate and the interior negotiation around the desire which, generally, arouses hate. Let's take a fairly common example of a family conflict, a sibling conflict. Suppose *A* is angry with *B*, his brother or sister, over a house problem, common inheritance, for sale or not for sale. The conflict has escalated over the point that *A*, who wants the house sold, has strong feelings of hate towards *B*. *A* often has murder fantasies towards *B* and, if he considers changing universe, he strongly desires a reality in which *B* complies with his desire to sell the house.

In this situation, what will hinder the change of universe are the fantasies of murder and the very intensity of the desire to change reality. Initially, an action on the fantasies is necessary, after all they are only mental formations, daydreams with a sedative aim for *A*. To thwart them, *A* will endeavor to create in him, in his consciousness , different thoughts, fantasies during which he sees himself as friendly with *B*, on a trajectory of reconciliation. If, in addition, *A* manages to reconcile somewhat with *B*, in reality the fantasies of hate and murder will disappear on their own. This will be a first barrier knocked down which prevented the change of universe.

Of course, the abandonment of such fantasies of hate involves a form of readjustment of desires. And that is the second thing to do. As with love, it is the renunciation of desire which is the surest means of attaining one's desire. *A*'s very strong desire to sell the house anchors *A* in this reality of conflict with *B*. Again one must understand the Buddhist position on emptiness. The point is not to renounce one's desire as if it were a defeat, a complete abandonment of desire. Desire is legitimate in itself, it is part of life. Simply, when it is not immediately realizable or when it is not realizable in this reality, it is advisable, at the same time, to maintain it and to be detached from it. The specific tetralemma for this desire is:

"Neither sold house, nor unsold house, nor sold house and unsold house, nor neither sold house and neither nor unsold house."

In practice, in addition to the friendliness and the effective reconciliation with *B*, *A* will consider the idea, the fantasy, of the sale of the house, in interior detachment. He is no longer swimming in the river of this desire, but he is sitting on the edge of the river and he calmly watches his desire to sell the house pass by. From there, *A* is in the most perfect condition

to be able to produce an *Ish* and a change of universe, where his desire to sell the house would be realized.

Joy, which can be accompanied by feelings of happiness, is obviously an emotion that strongly attaches the person to phenomenal reality. Joy is a somewhat stultifying positive emotion, it does not encourage thinking and then, why would a joyful person, living in happiness, want to change universe? The same is true of its opposite, sadness. Already, at the level of phenomenal action, all psychiatrists and psychologists know that depression is accompanied by feelings of helplessness and passivity. Sadness, too, does not encourage the person to want to change universe. The person lives in ideas of fatality and helplessness, his only reactions to his situation being tears and complaints. Sometimes it can happen that a change of universe occurs for people who are too happy or too sad; but this is usually done against their will, by a saturation effect. Here desire hardly comes into play, such people have no desires.

Fear is another important emotion that leads to a strong attachment to the universe in which you find yourself. As we commonly say: fear paralyzes. It not only paralyzes reactions, behaviors, but it also paralyzes the psyche. The frightened person loses most of his means, he is passive, he tends to isolate himself, to avoid confrontations. Also, for such anxious people, the very prospect of a universe change is in itself frightening.

Whether it is sadness or fear, before even considering changing universe, such people must do a long inner work on their emotions. Psychotherapy, or a first approach to spirituality through yoga and a little meditation, can help them. But, it is usually a long process before such people are ready to consider a major change in their lives.

Desires

Desires are the essential drivers of change and this also applies to this major change which is the leap into a parallel universe. However, desires also carry a huge load investment on the initial universe, the one in which you find yourself. Desires relate to this universe: you want this or that, you want a person, a car, a house... And besides, the whole of modern society is built to arouse desires, so that these desires are endless. There is always a new smartphone to buy that is even more formidable than the previous one. We want the same car as the colleague or the neighbor. We want three televisions, two computers, a tablet, in addition to the smartphone. There is always a new girl to fuck, a new man to love.

To be rich, to have a nice house with a swimming pool, to be well dressed, to eat in the best restaurants, to buy luxury goods, to travel, to experiment, to learn to pilot, to buy a sailboat and to sail the oceans, to buy a castle, buy at least three cars: a family car, a sports car and an all-terrain vehicle... In Buddhist teachings, desires are described as an endless string of pearls, it never ends. Each desire leads to the next and one is never satisfied. Dissatisfied billionaires who commit suicide exist. They seem to have everything to be happy, but deep down in their happiness there is always the desire, often the desire to be loved, something very difficult for a billionaire to achieve.

Desires lead to a real fascination with the material reality in which the person finds himself. But desires can also be spiritual. In the Buddhist teachings, we speak of these "crazy" yogis, ascetics, hermits, so-called sages, who lose themselves in deep meditation in the frantic search for *Nirvāna*. They too are chained to their desire for spiritual realization.

Of course, as we said at the beginning, the desire is necessary, at the beginning, to give a motive to universe change. However, beyond that, it is important to be able to

detach oneself from desire, to take an inner distance from desire. It is important to nurture confidence in this desire and our ability to achieve it. It is a question of leaving the sort of urgency, of absolute imperative, that desire often assumes. Desire must become a kind of intellectual notion and, to use the metaphor of the river, it is necessary first of all to leave the turbulent waves of the river of our desires and to sit down at the edge of this river to watch our desires in inner detachment.

Practically, and this is very well explained in the first chapter, it is a matter of evoking the goal to be reached, the object of the will, then putting that aside, as if it had already been achieved. Then, with confidence, we move on to the *Ish* technique, until the leap into a parallel universe is realized.

The beliefs

Beliefs are certainly the most powerful anchors in the reality of this universe. If for the emotions or the desires we used the metaphor of the river, for the beliefs we should use that of an immense and powerful *fleuve*, better still, the metaphor of a great ocean agitated by many storms, in which you are tossed about from all sides.

The most basic, most fundamental beliefs, as we have seen with the Mādhyamaka teachings about emptiness, relate to our reflex conceptions of reality. To conceive the world, the universe as a reality external to oneself, external to our body, to our brain, is a first powerful belief, which attaches us to this universe, conceived as a material universe. Nor is it a question of espousing the opposite belief, the idealistic belief that only consciousness exists and that everything else is only phenomenon to consciousness. Realism and idealism are alike beliefs that bind us to one form or another of reality. To go beyond this type of existential beliefs is to rest in the tetralemma of the emptiness of the phenomenal world.

It is the same for the belief in the self, in a form of personality which would be ourselves, the ego, the "I am." This belief mirrors that of a material world outside the ego. It is therefore a belief that binds us to the body and to the environment that surrounds the body. The ego then takes on consistency, it becomes an almost material thing, a flagship reality, around which all the rest of reality gravitates. This set of beliefs, of the material universe and of the bodily and spiritual ego, generates a strong attachment to the present universe. To go beyond self-belief, it is necessary to refer and rest in the tetralemma of the emptiness of the self.

Superstitions are also a powerful barrier preventing the universe change. If you believe that every tree in your garden is occupied by a spirit, that you must evoke the goddess of rain to have rain and the sun god to have good weather, if you are afraid of meeting black cats, if you think you risk die by passing to the left of the tower instead of passing to the right, that by passing under a ladder you risk attracting misfortune, that by wearing a charm around your neck you will ward off evil spirits, if you believe that your television or your car is a living being, if you believe in Santa Claus, etc., then you are not ready to change universe!

Indeed, each superstition is a form of explanation-solution that does not allow you to detach yourself from this universe. Superstitions always have an answer to everything, so why would you leap into another reality, into another universe, when this present universe is permanently transformable according to your desires, using all these little tricks of superstitions?

It is the same with religions. Here it is very important to specify that Buddhism is in no way opposed to religions. Buddhism respects all religions and believers. Of course, what Buddhism says about religions may displease some believers. We all know that some versions of religion are extreme, extremist, overly intolerant, aggressive and readily

contemplate the murder of all who oppose them. With such people, discussion is impossible, and the very idea of discussion is in itself blasphemy punishable by death.

It goes without saying that these extreme versions of religion represent a powerful anchor in the present universe and prohibit any hope of a leap into a parallel universe. Religions are generally paternalistic and infantilizing for humans. Religions do not encourage personal thinking, but on the contrary, they require that we adhere, without any criticism, to their conceptions, their beliefs, their dogmas. Generally, the process of religious generation takes place as follows: a human being who is characterized by his charisma and his ability to influence his fellows builds a system of beliefs (which is often accompanied by a system of rules of life and social life); he gathers around him disciples who undertake to spread the "good word" and who write texts; Subsequently, the human being in question is himself integrated into beliefs (that he would be an elected being, that his teachings would come from God, that the book then reflects the words of God, etc.); from there, a clergy is often formed, with its hierarchy of powers, which associates with other political and economic powers to take advantage of the religious passion of the people. Such a process of religious generation amply demonstrates the strong anchoring of religion in the phenomenal and materialistic world. The religious fact is, in itself, a constant agitation of ideas and emotions, a constant immersion in the affairs of the world, disguised as spirituality and priesthood.

The ideological corpuses of religions are, in general, simplistic and describe a world that is paradoxically completely materialistic, realistic, in which small selves are agitated. Above there is a great Self, God, the master of the game. After death there is the belief in hell or heaven, but even these infantile visions are often only materialistic extensions of this present universe. Hell is like this, paradise like that, there we find the ego, the person, surrounded by

other people, engaging in various activities or undergoing various situations. Or again, in the belief in reincarnation, the ego is born, dies and reincarnates in another body, to lead a new life. Such beliefs are an encumbrance of the mind, made by the mind itself. This occupies him, reassures him, gives him a "meaning to his life," but all this is only attachment to the phenomenal universe.

Sometimes religions can go beyond these secular versions of spiritual reality. Their teachings can then explain that descriptions of hell or heaven are metaphors, to say things otherwise inexpressible with words. However, apart from a few great initiates, the very large mass of religious believers are unaware of such subtleties and remain convinced that after death, one can find oneself in a hellish place where one will encounter demons, or else in a heavenly place where we will meet angels, even God himself.

We have seen, speaking of the Brahman's net, a large number of religious beliefs, in a creator God, in an eternal soul, in the material universe, in a reality after death, in the possibility of reaching the *Nirvāna*, etc., are impediments to understanding and experiencing true emptiness. The very inability to access emptiness, to understand and deeply feel its tetralemmas, represents a powerful attachment to this universe and a considerable obstacle to considering any leap into a parallel universe.

Kulayarāja Tantra, one of the fundamental texts beyond Mādhyamaka itself, is very clear on this point: emptiness is unattainable for those who are mistaken in believing that it truly exists a path towards something that should be achieved, that it is necessary to make efforts to obtain something, that there are causes and effects and that one can play on the causes to produce effects, that there are laborious actions to set in motion, precepts to follow.

The Kulayarāja then speaks to us of "*rigpa*," the natural consciousness, that which sees precisely emptiness and the

emptiness of emptiness. We are here, beyond all conceptions and beliefs and, obviously, far from religions. Religions are not rejected, not even criticized, Buddhism simply sends us back to our personal responsibility, to our personal choices. Nothing, nor anyone, forces you to give up your beliefs, your faith. But, it is obvious that to reach *rigpa*, to position oneself in the emptiness of emptiness, in *Śūnyatiśūnya*, one must make the personal choice of abandonment (we will not say rejection, which would also be too vis-with respect to the concept itself of emptiness) of religious belief. And this is a certain imperative in order to be able to change universe.

Rigpa is this natural and "pure" vision, in the sense of "cutting through" dualistic conceptions, as they are presented and taught by religions (among other philosophies). *Rigpa* also implies a form of spontaneity, of letting go, of surrender, beyond all effort, all accomplishment. Religions also enclose us in the circle of desires, emotions, reactions, in the dualistic *Samsāra*.

There is a form of modern religiosity, which is grouped under the name "New Age," which the late Chögyam Trungpa also called "spiritual materialism."[32] New Age is a current of ideas that developed in the West from the 1960s. Its eclecticism and diversity mean that this spiritual and personal development approach is saturated with beliefs of all kinds. Here are a few :

– There is a universal consciousness that permeates everything.

– We are entering a new era of spirituality for humanity: the age of Aquarius.

– It is possible to communicate (this is "channeling") with entities belonging to other dimensions, angels, extraterrestrial entities, "ascended masters," "beings of light"…

– Chance does not exist, everything that happens comes from a "universal principle."

– A new Messiah will arrive (the new Christ, the Antichrist, Lucifer, Maitreya the new Buddha…).

– Meditation can heal, influence the world, society, etc.

– Drug use can lead to personal development, contact with entities, healing of various disorders mental.

– There is an aura that surrounds every being that some can see.

– There are personal advisers and protectors (angels, deities, Christ, extra-terrestrial entities…).

– The Earth is a living organism according to the "Gaïa" belief.

– Many beliefs appeal to shamanism, druidism, Greek, Roman, Slavic, Celtic, Hindu, Native American, etc.

– The biological body is coupled with an "energetic" body, called "subtle", with its aura, its "etheric" aspects, its chakras, its subtle energy currents, etc.

– One can personally experience God, the divine is in oneself.

– The ego of the human being is immortal.

– There are special children whose aura is indigo in color.

– Beings are reincarnated from life to life…

All these New Age beliefs, of which we have given here only a very small sample, can be grouped under the notion of "spiritual materialism," an apparent contradiction, in fact, an oxymoron. While spirituality, especially in its Buddhist perspective, is intended to achieve a form of inner stripping, to wear down the ego, the self, like an old shoe, its New Age version, on the contrary, diverts spirituality to the benefit of

the ego, to nourish it and make it grow, strengthen it. For this the person will set out for several types of "hunts:" the hunt for teachings, the hunt for techniques, the hunt for masters, gurus, the hunt for the exotic, the hunt for extreme experience, and so on. The person abandons all his habits of life, he stops smoking and drinking alcohol (which is still positive), he becomes a vegetarian, he gives up telephone, car (except the plane to go to Tibet or India!). He joins organizations, sects, begins to do yoga, meditation, tantra. He tries a whole bunch of "techniques:" breath, mantra, void, sex… He saves to pay for internships, stays in ashrams at the end of the world. The farther and more exotic, the better.

There, the person is completely on another planet: he gets up every day at four o'clock in the morning to recite mantras, he fasts, he compels himself to painful physical and mental exercises and can, sometimes, have the impression of living some new experiences of altered consciousness that he will consider as his own *Nirvāna* (or at least a step towards *Nirvāna*). Some people will experience sensory isolation, use drugs, engage in mystical dances, ritual chanting, seek trance, walk on fire, may use sexuality as a spiritual (or so-called spiritual) experience.

Back home, after a few weeks or months away from family, usual friends, and the world of work, the person comes back with their spiritual baggage, the suitcase is more or less full! He tells his parents, his friends, his colleagues, how it was "over there," all the marvelous experiences he had and then, his *Nirvāna*… Ah, the *Nirvāna*! So great! Everyone admires him, admires his courage and his determination, it is that one would almost take him for a reincarnated Buddha! The person is very inspired, indeed, at the beginning…

And then, as the tide recedes, days, weeks and months pass. The everyday, the trivial, the material and the relational are inexorably returning. Over time, the person feels more and more disconnected from their "experiences." He tries

again to reach his "Nirvāna," but it does not work, "bad influences" or "bad karma." The spiritual ego gradually deflates, the little Buddha is no longer what he was. The person therefore thinks of leaving again, of redoing his journey, of renewing the exotic magic. Or, he joins a club near her home, he becomes a follower of an immigrant guru. He is an activist and begins to "teach" himself, to make himself believe that there is still some little Buddha left in him. Sometimes the person can find a way to move on. But the second trip is rarely like the first.

As with sex or drugs, the second experience will never equal the very first. The ashram internship quickly becomes painful and tedious. Finally, the trip turns into a tourist visit: a hotel, with restaurant and bathroom, is still more comfortable!

In what way is spiritual materialism a path of error? As we have described, instead of wearing down the self, the ego, this form of spirituality only strengthens the ego: we arrive at the spiritual ego, the pinnacle of self-deception! Which means a lot of clinging to reality, through beliefs, modern superstitions, special practices, rules to follow. The person is no longer quite himself, but it is not that he would have evolved, that he would have advanced on the path (we do not particularly need all that to advance on a path… which basically does not exist), no, on the contrary, the person has become weighed down, charged, encumbered with all his so-called "spirituality." His ego is puffed up with "knowledge" and nebulous conceptions. We are very far from the simplicity of the tetralemmas, from their silent intuition, from emptiness and the emptiness of emptiness. Here again, such a burden of the ego is a true ball and chain which hooks the person in this version of the universe, preventing the leap into another universe.

The quantum mystification

Among the "New Age's" beliefs some interest us more specifically, since they relate to quantum physics. These are pseudoscientific beliefs, based on erroneous interpretations or overinterpretations of quantum experiments and their results. These beliefs will serve, in turn, to confirm other esoteric beliefs, generally of Eastern origin. It also sometimes happens that scientists who popularize their knowledge, their work, are led to use metaphors, metonymies, figurative expressions[33]. Such figures of language are then taken up, diverted, reinterpreted, taken literally, in the first sense, to feed the New Age belief system. This body of beliefs has been dubbed "quantum mysticism." It is also "quantum mystification."

The process of mystification unfolds as follows: on the one hand we have everyday reality, trivial, materialistic, realistic, causal, in a word "classic," where cats are cats, where you have to work to have money and paying for things, where things do not always happen as we would like, where nothing extraordinary ever happens and which is not perfectly and rationally explainable.

On the other hand, we have the romantic and magical reality of beliefs, superstitions, with spirits, occult forces, subtle energies and things that can happen who knows how. This is reality, let's call it mystical, where cats can be demons, where incantations and the smoke of incense sticks can make you find love again, where magic happens, where the effect can precede the cause, where one can time travel, where one can produce instantaneous effects, where strange things happen, which one cannot perfectly explain with reason alone.

Until classical mechanics and physics, say until Einstein, the physical sciences could side with trivial reality: materialism, realism, causality, rationality. But, with the advent of quantum mechanics and physics, the

representation of reality becomes more blurred, in any case it clashes with our intuitions of daily life, those which make us say that a spade is a spade. Quantum mechanics confronts us with strange objects, both particles and waves, "waves-particles," as physicist and mathematician Paul Dirac humorously put it. Objects that challenge our mental habits, strongly attached to the principle of identity. What would your child say if you offered him a "cat-dog," not a genetic chimera, a hybrid of cat and dog, but a cat superimposed on a dog? And what is more, by passing through the cat flap at the front door, he could become, in an instant, a real cat or a real dog?

In quantum mechanics, a system is not with certainty in a particular state, a particle is not present in a space with certainty, either. The state of a system or the presence of a particle are associated with a probability, a "probability amplitude," which is opposed to our certainties of daily life. If we told a mother that her baby is "probably" in his cradle, there is every reason to think that we would witness the manifestation of strong anxiety. A baby "is" or "is not" in his cradle, the probability that he is there, say at 45%, is unimaginable!

In quantum mechanics, two objects can form a single system, be "entangled" (quantum entanglement), so that, even at great distance, they remain linked and the modification of the state of one of the objects will influence instantly the state of the other object. Imagine two tops which, ten kilometers apart, would behave exactly and instantaneously in the same way: turning in the same direction, at the same speed, with the same oscillations and falling at the same time! In our daily life we are accustomed to "local realism:" the properties of a thing or a system can only change in interaction with another contiguous system: a nail sinks because a hammer strikes it. Separate objects, at a distance from each other, cannot influence each other. The influence of objects between them necessarily passes

through direct contact. Or, if the influence passes through the transmission of information (a radio signal that triggers a remote contactor, for example), the transmission of this information cannot exceed the limited speed of light[34]. The quantum theory is "non-local:" an influence can be transmitted immediately, whatever the distance.

In quantum mechanics, there is a principle of indeterminacy which basically says that it is not possible to determine both the position and the speed of a particle. It is cheese or dessert, but not both. Either we know the position of the particle, but at that moment its speed cannot be determined, or the reverse. Imagine your friend (having a traffic violation, but that is another matter) calls you on his cell phone, while driving and says to you: "Here, I can tell you: either where I am on the journey, or at what speed I am driving, but I cannot give you both information at the same time." That would be a very strange world! And yet this is the reality of quantum mechanics: we cannot simultaneously know the position and the speed of a quantum object; we cannot simultaneously know its position and its energy (the frequency of the wave associated with it); we cannot know simultaneously the frequency of a wave and the exact moment of this measurement of the frequency; when we send "grains of light," photons, on a mask provided with two very narrow and very close slits, we can never know by which slit the photons passed, etc.

Believers of mystical reality are constantly looking for guarantees, points of validation for their beliefs. In the past, a saint, a prophet, a spiritual master was enough to endorse beliefs ("the master said… so it is true!," "It is written in the Book, so it is true!"). But, nowadays, even believers have a requirement for scientific backing, especially among New Age believers! It reinforces and develops their beliefs, to associate them with scientific experiments and discourses, misunderstood, falsely interpreted.

This scientific guarantee was all the easier, since from the first conceptions of quantum mechanics, some scientists themselves, despite their academic training, despite sometimes a Nobel Prize, were able to sink into hazy speculations and theories. The best scientists, indeed, are not exempt from beliefs. Humans' thirst for mystery and magic, the desire for a theory that would explain everything, has led many doctors, biologists and physicists to invent pseudoscience, which the followers of mysticism and mystification then feast on: parapsychology, ufology, telepathy, telekinesis, homeopathy, naturopathy, archaeo-astronomy, psi force, memory of water, clairvoyance, dowsing, beliefs in "fluids," "energies," "forces," "waves," "fields," "shape fields" and so on…

In quantum mysticism, it is quantum mechanics itself which is recovered and diverted to serve as support for multiple beliefs. Some of the scientists who founded the theory themselves contributed to initiating this movement of beliefs. For example, for Wolfgang Pauli[35], quantum mechanics leads us into a beyond of science which could become the future religion of humanity. Pauli imagines (with Carl Gustav Jung[36] whom he frequented a lot), a theory of "synchronicity" capable of linking matter and consciousness. Erwin Schrödinger[37], with his dead and alive cat at the same time, which is a somewhat metaphorical illustration, contributed despite himself to quantum mysticism, by allowing Eugene Wigner[38]39 to construct a theory in which it is "consciousness" of the observer who interacts and who would produce quantum decoherence (stopping of the superposition of states).

In many quantum experiments, we realize that devices intended to try to compensate for quantum effects (for example, a detector to know through which slit a photon has passed) cancel these quantum effects. From there, a scientist will say that: "the detection device made the quantum effect disappear;" a scientific journalist will take up this

information by saying (by metonymy) that: "observation has made the quantum effect disappear;" a follower of the New Age will say in turn (the metonymy of the metonymy) that: "the observer has made the quantum effect disappear;" and a New Age guru will say, as for him (new metonymy), that: "the thought of the observer made the quantum effect disappear." From metonymy to metonymy, a shift in the meaning of the initial sentence is produced and a "photon detector" becomes the "thought of an observer who acts on photons!" It is magic!

Thus, the "magical" concepts of quantum physics are recovered to serve New Age beliefs:

– the wave-particle duality becomes that of body (or matter) and spirit;

– the principle of indeterminacy justifies believing in magic and "powers," believing that one is no longer certain of anything, that "everything is valid," that "everything is possible;"

– the so-called role of the observer (of his thought) comes to support beliefs in psychokinesis;

– the entanglement of quantum objects, non-locality, explain the remote and immediate action of the bewitching sorcerer, the healing shaman;

– the probability of the presence of quantum objects is taken up to justify the existence of the soul, spirits and divine determinism;

– the "wave function," which makes it possible to describe quantum objects, becomes the belief in "waves" which would emanate from things or beings, which could have effects, on which one could act…

And so on… From such beliefs, everything becomes quantum: quantum medicine, quantum DNA, quantum psychology, quantum relaxation, quantum meditation, quantum water, quantum life, quantum free will, just like the paranormal, teleportation, magic and clairvoyance…

Again, quantum mystification and its associated beliefs chain the believer to this universe. The believer is convinced of obtaining "magical" results from something "quantum," which amounts to expecting a result in this universe, in the same way that another believer will believe in the effects of mantras, magic formulas, of a stone, of a sorcerer, of an intercessor God, of Santa Claus! Belief places the believer far from inner detachment and letting go, which are necessary to be able to change universe. The believer makes his choices, freely, and no one can blame him and his choices are quite respectable. However, universe change obviously requires another vision of things and of the universe.

THE QUANTUM WEAVE

Ontonomic cosmology (the informational ontonomic model of the universe – and soon we will say of the "multiverse") will be addressed in the second part of this book. Until now, it was very important, you must have understood it well by now, to know the modes of thought and analysis of Mādhyamaka Buddhism, this for two reasons: first, it was important to know well the Buddhist approach to the great questions concerning the universe. These questions are answered using the logic of tetralemmas and the intuitive work of thought around the concept of emptiness. This Buddhist approach to metaphysics has allowed us to stay on the middle path, that of the undecidability that stems from the tetralemmas.

From the Nagarjunian tetralemmas, three great vacuities could be demonstrated:

1. The emptiness of the phenomenal world: phenomena are "empty," that is to say they have no consistency, because they do not have an independent and certain identity. Phenomena are only compounds of other phenomena and all these phenomena are related to each other, depend on each other, are the causes of each other. It is the conditioned co-production which is just as well demonstrated by the most scientific physics which has demonstrated that all matter-energy is made up of particle-waves of which, finally, quantum mechanics shows us the elusive character.

2. The emptiness of the ego: if the phenomena, the universe, are elusive, then perhaps we could cling to the ego. But, there again, the ego, the support of consciousness, itself appears as an aggregate phenomenon of other phenomena. The phenomenological reduction (transcendental epoché) and the reduction to emptiness demonstrate to us that self-consciousness and phenomena are inseparable, but also linked in their inconsistency. The ego is therefore "empty," too, elusive, except to cling to illusions, such as solipsism.

3. The emptiness of emptiness: finally, as it was tempting, in the face of so many "emptinesses" to cling to emptiness itself, the Mādhyamaka attacks the very conception of emptiness, with the help of the Prajñāpāramitā. A final act of intuition allows this emptiness to be destroyed which, in the end, turns out to be a new and final content of the illusory ego. One arrives at *Śūnyatiśūnya*, the emptiness of emptiness, when only silence becomes the answer to all questions, when there is no more wisdom, no path, nothing to reach or not to reach, neither *Samsāra*, nor *Nirvāna*.

If the Buddhist metaphysics of the Mādhyamaka began to allow us a first detachment from erroneous conceptions, from illusions, as to what exists, as to the global approach of our existence in this world, secondly, the Mādhyamaka showed us how we were not imprisoned in the Brahman's net. A beautiful metaphor, which brings together a large number of philosophical, metaphysical and even religious conceptions, each more illusory than the other and which attaches us deeply to our universe, to phenomena, to our body, to our ego, to a divinity, to *Nirvāna* or to God knows what! Likewise, the analysis of the three great impediments shows that our emotions, our desires and our beliefs of all kinds (including "quantum mysticism") are also anchors which fix us in this universe and which hinder all possibilities of changing universe.

Finally, if we wanted to sum up the teachings of the Mādhyamaka in a single word, it would be "detachment:" detaching oneself from all sensations, from all perceptions, from all reactions, from all emotions, from all desires, from all conceptions, from all beliefs. For the Madhyamaka this detachment is aimless, without object, without objective, because from all this we must also detach ourselves: tetralemmas, intuition, emptiness…

However, the Mādhyamaka says nothing against, does not prohibit, places in the logic of the tetralemma, the will and the desires. Thus, as we have explained to you very well (with reference to the Bhagavadgītā), the problem is not that of desires, of action to realize them, but that of **waiting for the result of actions.** It is this expectation which binds, which is illusory, because it is that of an inconsistent ego, at the base. Therefore, desires and actions are acceptable, but without expecting anything from the result of the actions, without making the desires anything more than a small spark of life, without making an obsession of them. And it is from this detachment from desires and the results of actions that other Buddhist teachings will be summoned, supported by certain interpretations of quantum experiments, to enable you to understand the fascinating concept of the "informational matrix" and its implications in the design of a multiverse and the possibility of universe change.

Quantum experiments

In the first chapter of this work, about the third physics, we announced an "ontonomic informational model of universe." This is a key hypothesis, which is developing more and more among quantum physics theorists: the phenomenal universe, the one we observe around us every day (including ourselves), would be the result of underlying information. Information structured in a sort of matrix, a network, located outside of space and outside of time, outside of matter-energy, outside of force fields. And it is the playing of this

informational matrix that would be translated into space, time, matter-energy, particle-waves, force fields, into... UNIVERSE! With this model, we are going to penetrate further than the heart of matter-energy, we are going to study being itself, in its most elementary form: the onton. Hence the name of the model: both "informational" and "ontonomic ."

But, before approaching directly the informational matrix, we must be interested in quantum experiments. These are extreme experiments, imagined and carried out by the greatest physicists and mathematicians and which lead us to the confines microscopic layers of matter, fundamental particles. In the chapter on undecidability, we mentioned one of these experiments, the princeps experiment of quantum mechanics: Young's double slits experiment (we will talk about it again), how photons behave, during this experiment, sometimes like a wave, sometimes like a particle, without being able to say if they are one or the other, placing us face to face with this mysterious quantum duality of the particle-wave.

Other experiments of this type, using lasers, semi-transparent mirrors, detectors, have enabled physicists to flush out the extraordinary characteristics of elementary particles. With such experiments, we enter another reality: where the particles are also waves and the waves are particles; where one cannot know with certainty both the speed and the position of an object; where objects can be linked, acting, changing state, simultaneously, regardless of the distance between them and so on. A strange, counter-intuitive reality, very different from the macroscopic world in which we live on a daily basis. However, a reality that underlies our daily reality, which is its substrate, because everything is ultimately made up of elementary particles and their various combinations: quarks, photons, neutrons, protons, electrons, which make atoms, molecules, objects.

These experiments are very important to know and to understand well insofar as they are the ones that bring us closer to the informational matrix. Quantum mechanics, quantum experiments and their interpretations thus begin to speak to us half-wordly of this matrix, of the information which constitutes it, of the structure of this information and the strangeness of the results of these experiments refers to the strangeness of the information matrix. But at the same time, beyond the strangeness itself, we will begin to understand the properties of this matrix, from which the universes spring. One more step towards our ability to free ourselves from what binds us, to change universe. For all these experiments, their description will be accompanied by very simple and explicit illustrated diagrams, easy to understand, in order to allow everyone to understand them and to begin to get an idea of the matrix underlying our universe, like in other universes…

Thomas Young's Double-Slit Experiment

This is the very first of quantum experiments and it is not new, since it was carried out for the first time by Thomas Young in 1801! This experiment is important, because it demonstrates very simply that light is of a wave nature… and a particle all at the same time. Important experience because the other quantum experiences derive from it and above all… because you will be able to do it yourself! Indeed, rather than describing this experiment to you as it can be carried out in the laboratory with special and expensive equipment, we are going to explain to you how to carry it out at home, very easily. Take advantage of it, because other quantum experiments are not as easily accessible.

First of all the material to gather. You need a point light source, a laser. You can easily find lasers on the market. It is enough to acquire a pointing laser for conference or a laser level to make masonry or to hang pictures on the walls. Then

you need a sheet of Bristol board or a visit card, an office cutter (thin blade) and a ruler.

Here is how to do it. First, prepare the box. With the cutter and the ruler you drill two thin slits side by side and parallel, as close as possible to each other (less than a millimeter). Next, you will arrange the laser, the mirror and the screen as shown in the Fig. 1.

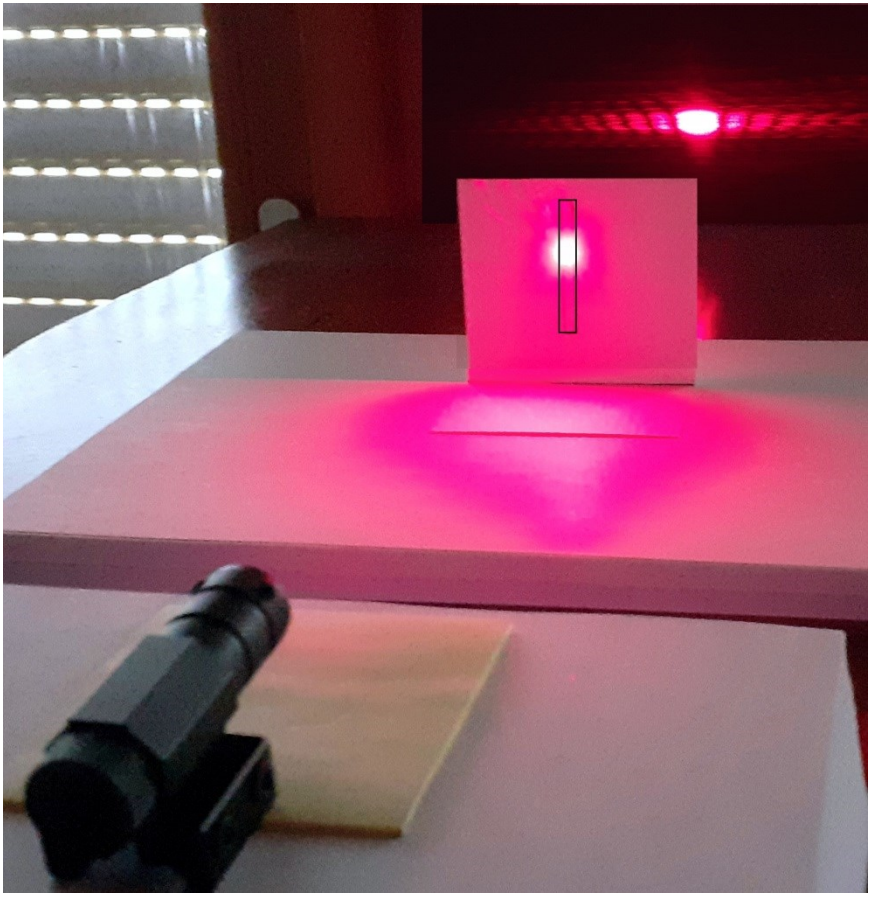

Figure 1: In the foreground (bottom left) the laser pointer. In the middle the Bristol card with the two slots (in the box drawn with pen). In the background the interference fringes (they have been slightly enlarged for the visibility of the illustration).

We know that light is made up of “grains,” photons, which go in a straight line. The proof being precisely that lasers are commonly used to aim or to draw level lines. If the photons were just particles, some would pass through one slit, the others through the other slit, and we would have two points of light, side by side, on the screen (Fig. 2).

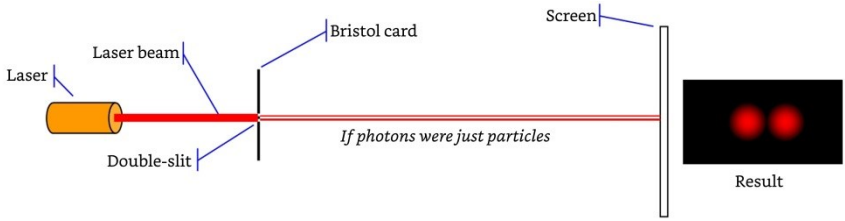

Figure 2: Young’s double-slit experiment, experimental device. If the photons were only particles, some would pass through one slit, others through the other slit and we would obtain two luminous spots. This is not what happens, because photons are also waves.

But things do not turn out that way. When the laser beam hits the two slits in the mirror paint, on the screen you will see something that looks like what is shown in the Fig. 3: interference fringes.

In fact, at the exit of the slits, the photons no longer behave like grains of light, but like waves, a train of waves emanating from each slit, the two interfering with each other, just as when you simultaneously throw two stones into a pond. In the figure, these two wave trains have been represented schematically by increasing circles. The result is these interference fringes on the screen, alternating bright and dark areas, the fringes decreasing in intensity and width on either side of the center.

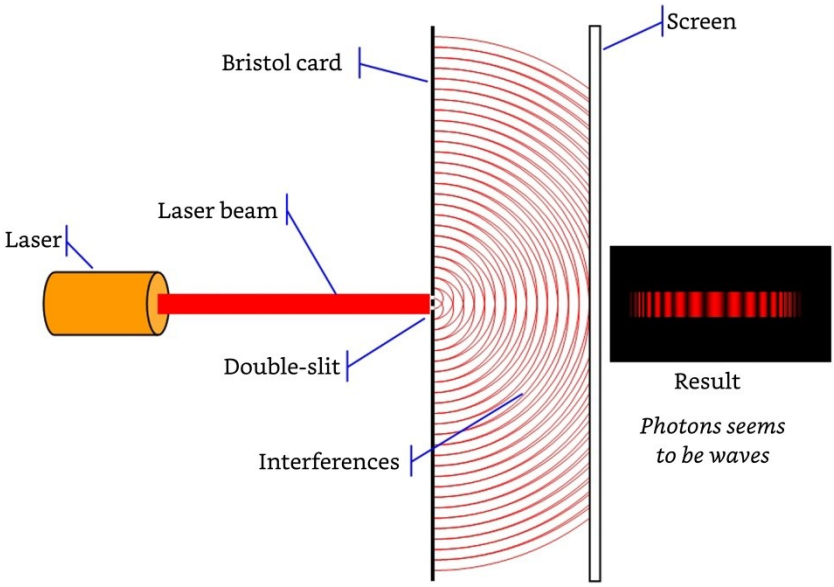

Figure 3: Young's double-slit experiment, interferences at the exit of the slits. Interference fringes of light waves with themselves after passing through the two slits.

The proof that it is indeed waves: if you move the screen further or closer to the Bristol, the interference fringes contract or widen. If you could place, instead of a simple screen, a photoelectric cell, this one, lit by the interference fringes, would produce a slight electric current. However, this electric current is produced by photons which tear the peripheral electrons of the silicon of the cell from their orbits and only "grains," particles, can produce this effect and not waves. So, the "photonic waves," light, once they touch the screen, become grains of light again.

It is for this reason that we say that photons are particle-waves, both particles and waves at the same time, it will depend on how we look at them, in what context we observe them. The phenomenon is even more extraordinary in the laboratory, because physicists are not satisfied with a laser, but they use a photon gun, capable of emitting these particles one by one. In this situation, one might think that the

photons will pass through one or the other of the slits. But let's see what actually happens by looking at the diagram below (Fig. 4).

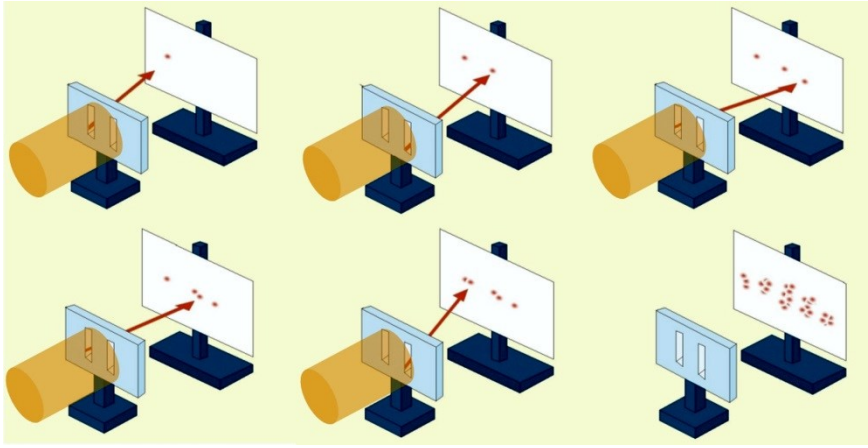

Figure 4: Young's double-slit experiment, photon-by-photon interference. Although the photons are emitted one by one, as they are emitted interference fringes still occur, as if each photon passed through both slits at the same time.

In this diagram, the cylinder represents the flow of photons arriving one by one. By reading the figures from left to right and from top to bottom, we realize that as the photons pass through the double slit, interference fringes are formed on the screen. This is quite visible in the following image (Fig. 5), which shows the screen on which the impacts are recorded as the photons arrive.

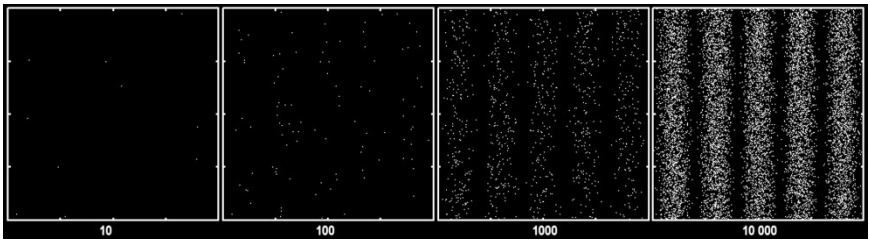

Figure 5: Impacts of individual photons after passing through the double slit. At the bottom, the number of photons emitted. The interference fringes appear gradually as the number of photons emitted increases.

Once again, if the photons remained particles, with a rectilinear trajectory, from the first impacts, we would only obtain two very small impact zones, corresponding to the two slits. However, this is not at all what we observe. The hits seem to spread randomly over a wide area (see screens for ten and hundred hits). However, as soon as we arrive at a thousand impacts, we realize that their distribution, although wide, is not random and that we find the pattern of the interference fringes, just as with a continuous ray of light. With ten thousand impacts, the fringes are quite visible and they will become more and more so by increasing the number of photons emitted. As all these impacts were each produced by a single photon, the only conclusion that can be drawn is that after passing through the slits, each photon interfered with itself, like a wave. Which also means that each photon has passed through both slits at the same time! A kind of duplication.

This quantum phenomenon of "splitting," linked to the dual particle-wave nature of objects, has been reproduced with other fundamental particles, such as electrons, atoms, molecules (electronically linked atoms), condensates of atoms ultra-cold (Bose-Einstein condensates), fullerene molecules (large molecule of sixty carbon atoms arranged geometrically). From the point of view of classical physics, the phenomenon is inexplicable. But from the point of view of quantum physics the explanation is as follows: the photon (or electron, etc.) adopts a so-called "superposed" state when passing through the two slits, which is mathematically described as a "function of wave," which makes it possible to calculate the probability of position of the photon at the exit of the slits, that is to say an interference figure. This confirms that the photon "passes through both slits at once."

For some quantum physicists, this "wave function" has no physical meaning and is only a pure mathematical formula (this is the so-called "Copenhagen" interpretation, supported by Niels Bohr, Max Born, Werner Heisenberg and Pascual

Jordan). For this school of thought, the "particles-waves" do not form a world of determined phenomena, but a world of potentialities, possibilities, probabilities. And it is the encounter between the observer, via his instruments of detection (starting with his body and his sensory organs) and of measurement, which produces the phenomena as a result.

For other quantum physicists, the interpretation of Young's double-slit experiment is more "realistic" and involves the concept of "pilot wave." For these physicists (Louis de Broglie, David Bohm, John Stewart Bell, Basil Hiley, Sheldon Goldstein), their interpretation is that of a wave that defines lines of possible trajectories for a moving singularity associated with it. In other words, the wave is what guides the particle which, itself, is only a singularity of this wave. For the pilot wave theory, the photon only passes through one or the other slit, but it is the pilot wave that interferes with itself after passing through the two slits, normal behavior of any wave.

ONTONOMIC IMPLICATION

Within the framework of the informational ontonomic matrix model, and in view of what quantum mechanics draws of the microscopic world, it is no longer possible to conceive that the playing of the informational matrix directly produces "matter," "energy" or "particles." In fact, quantum mechanics shows us that what prevails are, at the start, the waves, the oscillating fields of force. The rest, particles, matter, energy would result from interactions, notably interferences, between wave systems. As such, even the photoelectric effect, which is said to account for the "corpuscular" aspect of light, would arise from an interaction between two waves: that of the "photon" and that of the "electron" which "absorbs" the photon, depending on the frequency (energy support) of the "pilot wave" of this photon. Quantum physics explains to us that the electrons which revolve around the atomic nucleus are not like small planets revolving around their sun (Rutherford model). One speaks rather of an

"electronic cloud" in which the electron is everywhere and is actualized only on the occasion of an interaction with another "particle-wave." From there, one can see the electron itself like a wave and its charge and its mass would be, finally, only the effect of the interaction of this electronic wave with other waves.

The (Aspect's) EPR experiment

It is in fact a series of experiments carried out in the 1980s by Alain Aspect, Phillipe Grangier, Jean Dalibaud and Gérard Roger[39]. These experiments were intended to resolve the EPR paradox (from the name of its authors: Einstein, Podolsky and Rosen). This paradox was presented as a thought experiment (i.e., following the principles of quantum mechanics, an imagined experiment and its result, intended to stimulate researchers to carry out real experiments). Let's see this experiment as it is illustrated in the diagram (Fig. 6).

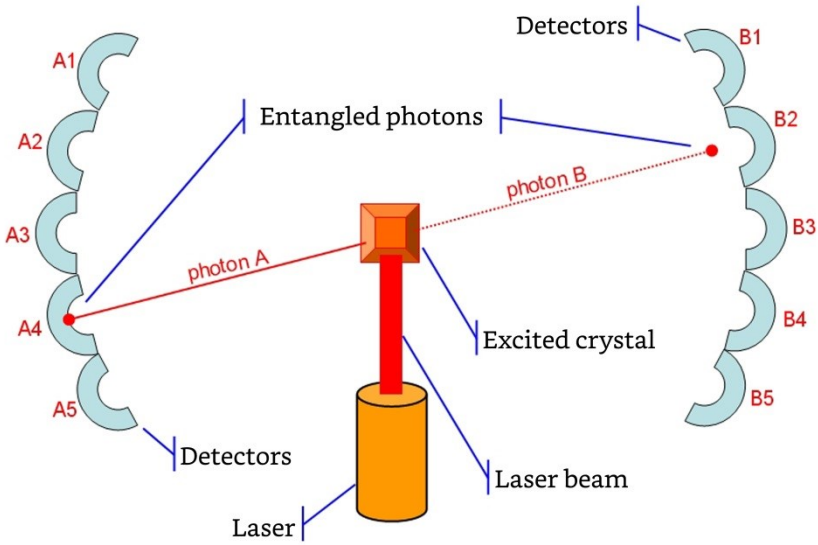

Figure 6: EPR paradox, thought experiment. Given the difference in the distances of the two groups of detectors with respect to the crystal, photon *A* reaches detector *A4* first. Therefore, how does photon *B* "know" that it must appear in the opposite detector *B2*?

A crystal is at the center of an enclosure which comprises photon detectors: *A1-5* and *B1-5*, knowing that the *B1-5* detectors are a little further from the crystal than the *A1-5* detectors. The crystal is subjected to laser radiation which excites its atoms, which produces the emission of two photons called "correlated twin photons" or "entangled photons" because, as predicted by quantum mechanics, these two photons are in the same quantum state and, in particular, they are emitted and travel opposite to each other. The direction of propagation is one of the parameters that define the photon. Here, the twin *A* and *B* photons have the same, opposite direction of propagation.

However, in the previous experiment, Young's double-slits, we saw that photons are not strictly speaking "grains" of matter. They are waves which can punctually give the impression of being particles on the occasion of interferences, of interactions with other particle-waves. This means, in the EPR experiment, that as long as the correlated photons are not detected, they are anywhere in the enclosure. Their leadership of propagation will only be determined when they interact with a detector.

However, as the detectors are not at the same distance from the emitting crystal, photon *A* arrives first on detector *A4*, which therefore indicates the direction of propagation of photon *A*. But photon *B*, which has not yet been detected, still on the way (dotted line), should normally be in quantum uncertainty: be anywhere. Except that, being correlated to photon *A*, it can only appear, be detected, in the opposite direction to photon *A*, that is to say in detector *B2*. The crucial question is the following: how does photon B "know" that photon *A* has been detected in *A4* in order to be able to "decide" to appear in *B2*?

You will have noticed that we have put the action verbs "know" and "decide" in quotes, because this personalization of photons is, of course, only a poetic way of saying things. In

reality, the photons do not know and do not decide, but what then happened so that *B* appears, after the fact, in the exact opposite direction of *A*? Not to mention that the *B* detectors can be placed at the other end of the galaxy, without this changing anything in the result of this imaginative experiment: *B* will always be detected at the exact opposite of *A*.

At first sight, we can take as true the predictions of quantum mechanics ("the entangled photons *A* and *B* will be detected opposite each other"). We must also take into account the fact that "nothing can move faster than light" (Einstein's special relativity), so photon *A* does not have time to send a message to photon *B* to tell it its direction of propagation. Finally, in physics, there is a principle of separability for bodies or systems very far from each other: they are therefore independent. However, faced with the phenomenon of entanglement, these three hypotheses (quantum mechanics, special relativity, principle of separability) are in contradiction. One of them is wrong. Which?

Quantum mechanics cannot be wrong, because it has confirmed and still confirms a multitude of experimental results, its predictions are unstoppable and it has given rise to technical applications (lasers, scanning tunneling microscope, superconductivity applied to medical imaging…) which confirms its validity. The same is true of special relativity and the GPS of our cars or our smartphones can attest to this. There remains the principle of separability. If this principle is false, it would mean that two objects, two systems, even very far apart, can… not be separated and function as a single system, at a distance!

This thought experiment was a challenge to physicists that they had to meet. This is what Alain Aspect[40] and his colleagues did in the 1980s. For this experiment, the physicists took another parameter of the photons, no longer

the direction of propagation, but the polarization, that is to say the orientation of the oscillations of the "pilot" wave of the photon. Here is, in the Fig. 7, the diagram of this experiment.

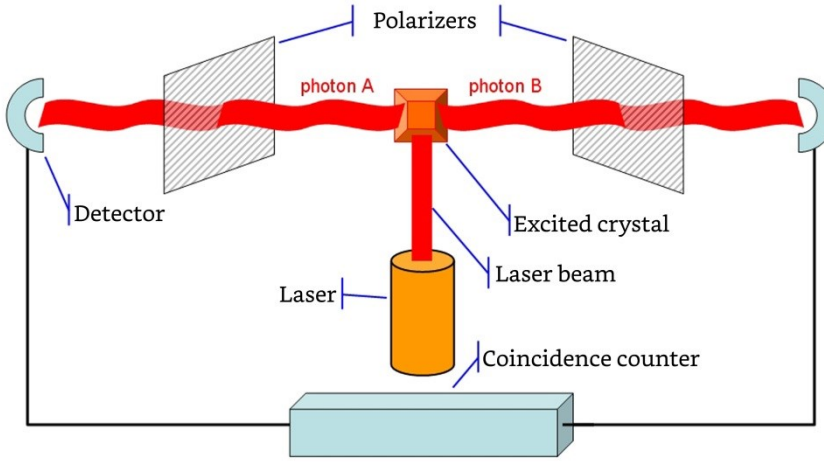

Figure 7: EPR paradox, Alain Aspect's experiment. In this experimental device, it is as if photon *B* "knew" that photon *A* had passed through the polarizer.

As in the imaginary EPR experiment, we find the laser which excites a crystal which causes it to produce two entangled photons which, in principle, because of their entanglement, have the same polarization. The polarizers therefore let the entangled photons pass each time they arise. They are received by the detectors which send a signal to a coincidence counter, which measures the arrival correlation of the entangled photons. The results of the experiment confirm those predicted in the Einstein, Podolsky, Rosen thought experiment. Entangled photons work as one system, even over long distances. It is as if photon *B* "knew" that photon *A* had passed through the polarizer.

In fact, rather than speaking of information which would pass from one photon to another (*A* informs *B* that it has passed) and which would imply that this information travels faster than light (because the experimental device is made for

that no hypothetical information has time to pass from one photon to another at the speed of light before the other photon behaves like the first); rather than speaking of an instant "magic" communication between the two photons, we are once again led to question the principle of separability: two systems far from each other can react simultaneously, this is what we also called "non-locality."

Experiments of the EPR or Aspect's type demonstrate the phenomenon of entanglement and the principle of non-locality, at least at the level of quantum phenomena. This means that two systems can change state or behavior simultaneously, even at very large distances. There is no transfer of information[41], the two particles-waves must be considered as belonging to the same system. The distance which separates them, even if it is counted in millions of kilometers or in light-years, is only an illusion, the two objects are well entangled, function as only one.

ONTONOMIC IMPLICATION

Within the framework of the informational ontonomic matrix model, and in view of the results of EPR type experiments (Aspect's experiments), we can conceive that the playing of the informational matrix produces oscillating fields (waves), likely to be "entangled" and to give rise, by interaction with detection instruments, for example, to entangled particle-wave phenomena. This means that the informational matrix gives two types of information: phenomenal spatialization information (for example, a photon is on Earth, another is on the Moon) and system state information (for example, the direction of propagation or the polarization angle of the wave). But these two pieces of information are decoupled, do not work together. The informational matrix, by virtue of its operating principle which corresponds to the decoupling between space information and state information, produces non-locality at the phenomenal level (at least at the quantum level).

The quantum eraser experiment

The so-called "quantum eraser" or "Marlan Scully's" experiment is easy to understand, since it comes from previous experiments of the Young's double-slit, EPR and Aspect's. It is very interesting for the ontonomic informational matrix model because, while confirming non-locality, it will also begin to question the notion of temporality. The experiment was proposed by Marlan Scully and Kai Drühl in 1982[42], we are going to present to you a recent version (2010) of this experiment, carried out by Christian Ferrari and Bernd Braunecker[43].

This experiment is based on a device called the Mach-Zehnder interferometer, a system intended to cause particles-waves to interfere, whether they are a continuous stream or particles sent one by one. The experiment is original in that, for once, it is not a photon that is emitted at the start, but an atom. The result produced by the first assembly shown in the Fig. 8 is equivalent to Young's double-slit.

An emitter sends atoms towards the semi-reflecting mirror *Msr1*. This mirror can send the atom, either towards the reflecting mirror *Mr1* (path *A*), or towards the reflecting mirror *Mr2* (path *B*), according to an angle of 90°. The reflecting mirrors return the atoms according to a new angle of 90° (paths *A* and *B* respectively) until the two beams of atoms cross on the semi-reflecting mirror *Msr2* and reach the detectors *D1* and *D2*.

If we follow "classical" physics, the detectors *D1* and *D2* must both receive one atom out of two: 50% of the atoms on *D1* and 50% on *D2*. However, this is not at all what is observed. A single detector receives atoms: *D1*. Quantum physics explains things this way: the interferometer should not be seen as a system that sends atoms sometimes to one side, sometimes to the other. In fact, the semi-reflecting mirrors (*Msr1* and *Msr2*) act like Young's double-slit: we do

not know where the atom passes (by path *A* or path *B*?), but what we do know is that at the exit of *Msr1*, then of *Msr2*, the two wave components of the atom propagate (direction of propagation) according to an angle of 90°[44] and interfere with each other, before reaching the detectors *D1* and *D2*.

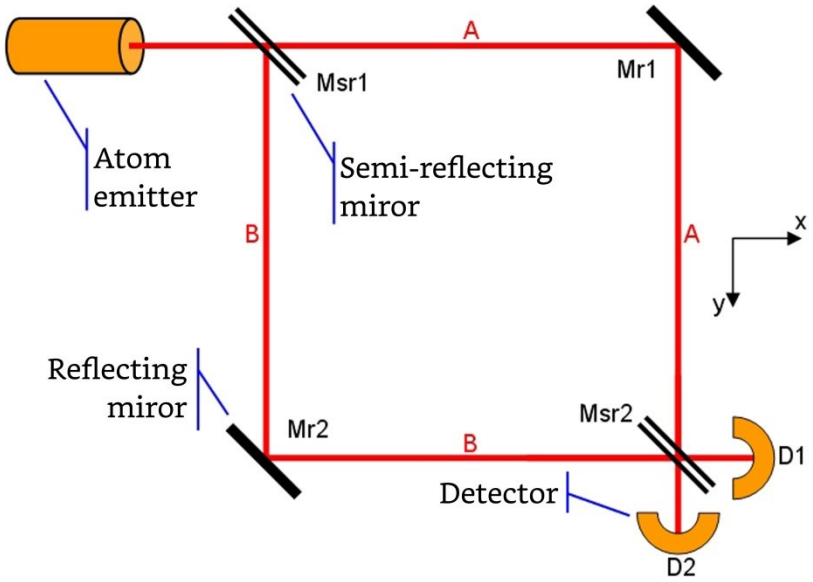

Figure 8: Quantum eraser experiment (1), equivalent "Young's double-slit" step. In this experiment each single atom is split into two entangled twin atoms which will interfere (like waves) with each other to produce a single interference fringe by illuminating the detector D1 and leaving D2 in the dark.

One of the two detectors (*D1*) is "lit," receives the atom and the other (*D2*) is "in the dark," it receives nothing. It is as if we had a single interference fringe: a single bright area and a single dark area. Question: why is it *D1* which receives the atom and not *D2*? The answer lies in the equations of quantum physics (which we will spare you the presentation), which show that the probability of manifestation of the atom after interference is 1 for the direction of propagation of emission of the atom (x) and of 0 for the perpendicular direction (y).

The question, from a "classical" physics point of view, is to know which path the atom takes, A or B? And how to know this information? Is it even possible to know it? To try to answer this question, the researchers added two path detectors to the device: *Dc1* and *Dc2*. See in the Fig. 9.

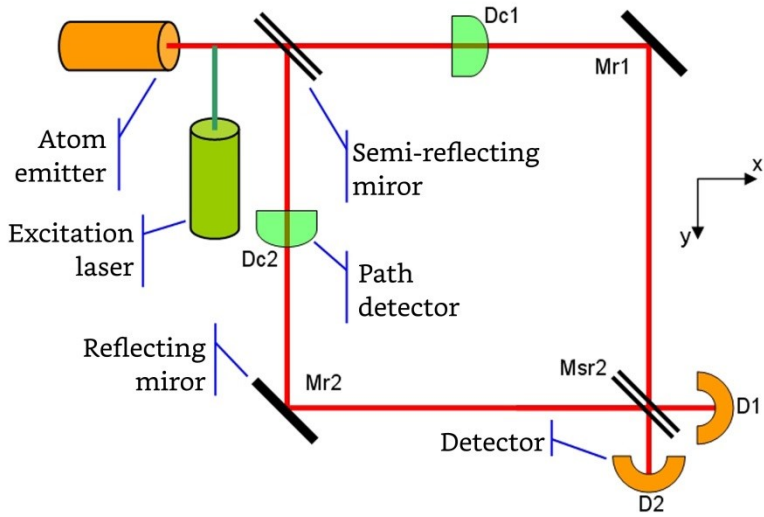

Figure 9: Quantum eraser experiment (2), "path detection" step. The *Dc1* and *Dc2* path detectors will be used to detect where the atoms pass, unfortunately, this simple detection will cancel the quantum interference effect: *D1* "lit" and *D2* "in the dark," both detectors are now lit.

Now, let us remember that this experiment is not carried out with "fragile" photons, disturbed by nothing, but with atoms. Just outside the emitter, these atoms are excited by a laser ray. The entangled waves at the output of the semi-reflecting mirror *Msr1* therefore correspond to an excited atom. This excited atom is interesting, because what concerns researchers is to be able to know ("classic" vision) by which path, *A* or *B*, the atom passes… without disturbing the atom!

To do this, path detectors only de-excite the atom, which releases a photon. The atom, meanwhile, once de-energized, continues on its way to *Mr1* or *Mr2*. On the other hand, the

photon in the path detector is the "trace" of the passage of the atom. We could take this image: the laser gave a token to the atom; when the atom passes through the path detector, all it does is deposit its token there and continue its journey imperturbably.

Was it possible, with such a system, to detect where the atom passes? The answer is yes. Either path detector signals the photon. The problem is that by doing so, the interference disappears! So we no longer have *D1* "lit" and *D2* "in the dark," but *D1* and *D2* are both "lit," which corresponds to what is expected from the point of view of "classical" physics: 50% of the atoms go on *D1* and 50% on *D2*. The mere presence of path detectors made the quantum phenomenon of interference disappear. Which corresponds to what is expected according to quantum physics: we can have either the interferences or the path; either speed or position; either the cheese or the dessert!

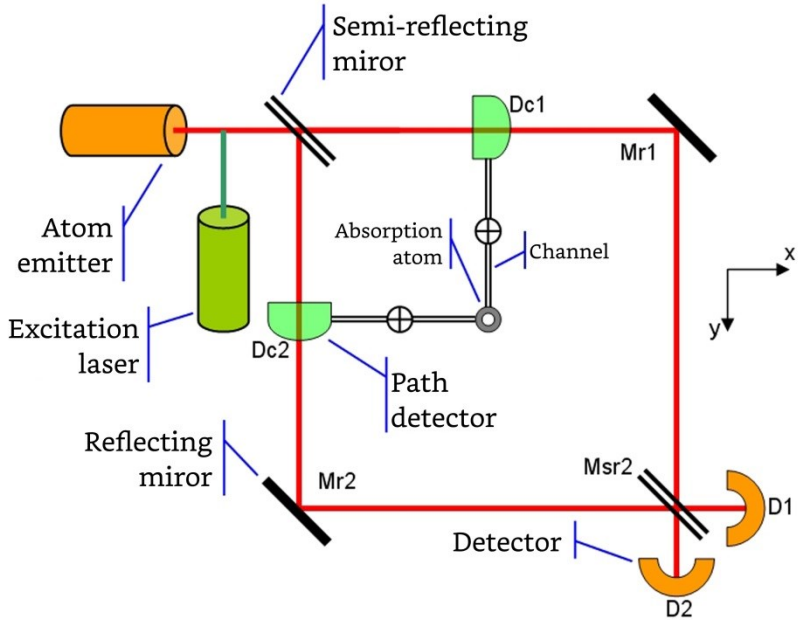

Figure 10: Quantum eraser experiment (3), "quantum eraser" step. If path detection is canceled with an absorption atom, the quantum interference effect is restored.

Now, we are going to see what will happen when we cancel the information given by one or the other path detector. Normally we should expect the interference to return. Let's see the device in the Fig. 10.

On each path-photon detector, we place a channel, which can be opened or closed, which leads the possible photon towards an absorption atom (an atom which will absorb the photon). The result of such a device is that, as long as the channels remain closed, the interference disappears (*D1* and *D2* are both "lit"). But as soon as the channels are opened, the photon coming from *Dc1* or *Dc2* is absorbed, which cancels out, erases (this is what is called the "quantum eraser") the information "by which path the atom has passed," which immediately restores the interferences… cheese or dessert!

To make this experiment more… telling, let's imagine that we place the detectors *D1* and *D2* at a great distance, say on the Moon for *D1* and on a satellite in "lunar" orbit (i.e. in the same orbit than the Moon around the Earth, but with an offset angle of 90°). Assuming that the atom from the device on Earth travels at a speed close to that of light, it would take 1.5 seconds to reach the Moon or the satellite (the Earth-Moon distance being approximately 380,000 km). See Fig. 11.

In such an experiment, 0.5 seconds after the emission of the atom, it has left the device and is at a third of the Earth-Moon distance. At that moment, the channels are opened, the photon which indicates "which path" disappears and there must therefore be interference: *D1* will be "lit" and *D2* will be "in the dark." However, at 0.5 seconds, our atom in the space between Earth and Moon, how does it "know" that the channels have been opened? During the second of the trip it has left to the Moon (or the satellite) it cannot receive any information from the device on Earth. And yet, if we carried out this experiment, this is indeed the result we would obtain: the atom "knows," instantaneously and at a very

great distance, that the channels are open or closed, if it must interfere or not[45].

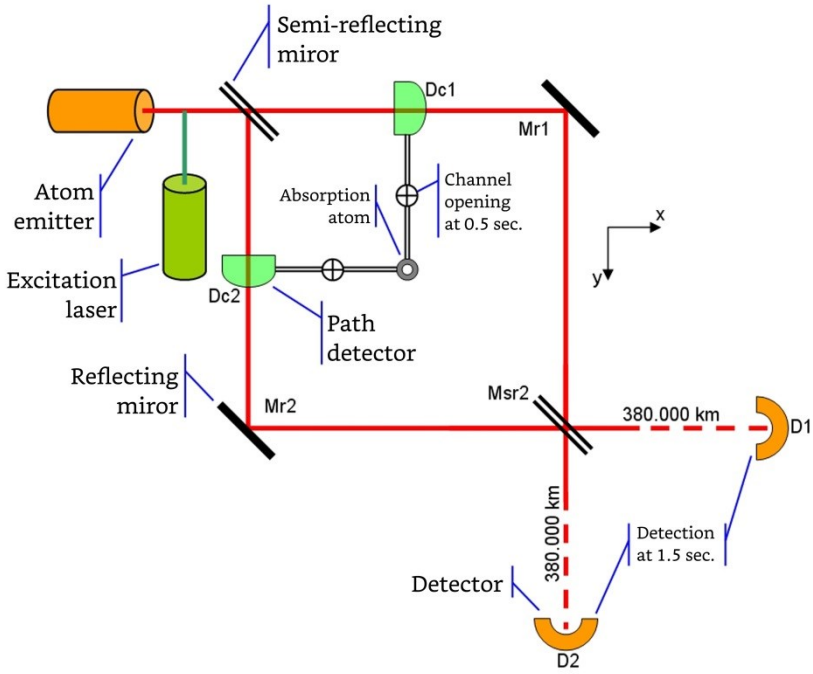

Figure 11: Quantum eraser experiment (4), "remote detection" step. If the detectors are placed at a very great distance (Earth-Moon), the atom "knows," instantly, that the channels are open or closed, whether it should interfere or not.

In fact, just as with Aspect's experiment, the verb "to know" that is used here is a misleading anthropomorphic image. The atom knows nothing and no information flows from Earth to the atom. Despite the distance, whether it is centimeters, tens of meters or hundreds of thousands of kilometers or more, it is important to understand that the atom, the photon, the detectors on Earth or elsewhere, form an entanglement system. When the photon is "detected," i.e. absorbed by *Dc1* or *Dc2* (which indicate the path the atom took), this means that part of the atom-photon system has interfered with *Dc1* or *Dc2*, which cancels the interference in *Msr2*, even if the atom has left the device on Earth for half a

second. And, conversely, if the channels are open, the photon no longer interferes with *Dc1* or *Dc2* which are on the circuit of the atom. The photon is absorbed by the absorption atom which acts as a quantum eraser, the atom interferes in *Msr2*, even if it left the Earth half a second ago.

ONTONOMIC IMPLICATION

Within the framework of the informational ontonomic matrix model, the "quantum eraser" experiments type confirm those of the EPR-Aspect type, namely that the entanglement information and that of spatialization are well decoupled. The notions of space, distance (and probably movement) have no meaning with regard to the phenomena of quantum entanglement. An entangled quantum system may very well have a "size" ranging from the Earth to the Moon or even beyond and function as if this space had no reality in itself. What will happen at one end of the system (here the entanglement or not of a photon with a detector) will also happen at the other end, instantaneously. In addition, quantum eraser experiments are beginning to open us up to another interesting question, that of time. Because it begins to appear that for such intricate systems, occupying large spaces, time is likewise an independent notion, apart from these systems.

The delayed-choice experiment

Looking carefully at the device of the previous experiment, the quantum eraser experiment, we notice that it would be interesting to place not only the interference detectors at a great distance, but also what controls the appearance or disappearance of these interferences (here the channels and the absorption atom). However, such an experiment has been carried out, it is the so-called "delayed choice" experiment which was first proposed by Wheeler as a simple thought experiment in 1978[46], imaginary experience which has since given rise to numerous very concrete

studies. We are going to present one of them to you, that of Yoon-Ho Kim, Marlan Scully and their collaborators, published in 2000[47] (Fig. 12). An experiment which begins to seriously pose the question of the status of temporality in quantum mechanics. The device, as it is presented on the figure, is very simple and does nothing but take again in an original way the elements which we saw before.

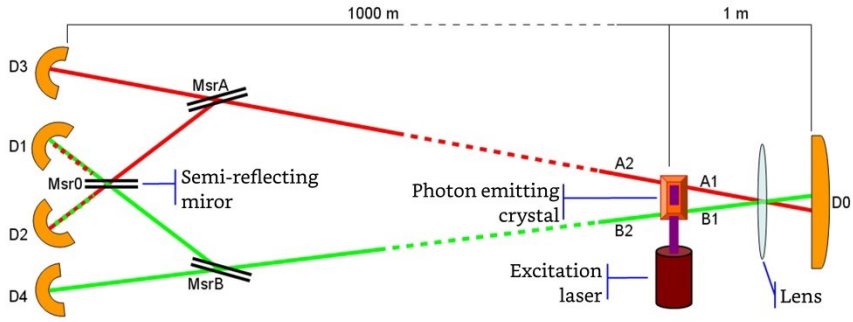

Figure 12: Delayed-choice experiment, timed quantum eraser. In this experiment, imagined by Wheeler, the photons interfere and meet the detectors 1 kilometer from the emission device. Is it *A1* and *B1* who "predict," 3 microseconds in advance, what *A2* and *B2* will do? Or is it *A2* and *B2* who "know the past" or who "change the past" of *A1* and *B1*, 3 microseconds in advance?

In this experience you find a number of elements that we have seen in previous experiments. An excitation laser stimulates two points, two atoms of a crystal, so that this crystal produces twice two entangled photons. Are emitted photons A and B which are entangled. But these photons A and B are themselves emitted in the form of two entangled photons (respectively A1 and A2, B1 and B2) which propagate opposite to each other (photons "1" to the right and photons "2" to the left). Thus, on either side of the crystal, a Young's slit effect is obtained, with entangled photons liable to interfere.

The right photons (*A1* and *B1*) pass through a lens and are detected by *D0*, while the left photons (*A2* and *B2*) encounter a semi-reflecting mirror (*MsrA* and *MsrB* respectively). These mirrors respectively send the photons either to the detector

D3 (for *A2*) and *D4* (for *B2*); or to a third semi-reflecting mirror (*Msr0*). The latter can send each photon both to *D1* and *D2* (this is symbolized by the dotted lines between *Msr0* and the detectors *D1* and *D2*). Note that, for this experiment, the photons are emitted one by one (well, four by four!).

The five detectors are connected to an electronic coincidence counter, which precisely records the moment of the impacts of each photon with each detector. Note that *D0* is a wide field detector capable of detecting the position of photons on its surface. After the experiment, the impacts of photons recorded by the counter are analyzed in order to identify the statistical correlations between the impacts on *D0* on one side and those on *D1*, *D2*, *D3* and *D4*, on the other side.

The results show a quantum eraser effect. When *MsrA* and *MsrB* allow photons *A2* and *B2* to pass to detectors *D3* and *D4*, the path of the photons is known, so on the side of *A1* or *B1*, to the right of the crystal, there is no interference of the photons with themselves. On the other hand, if *MsrA* and *MsrB* reflect the photons *A2* and *B2*, the semi-reflecting mirror *Msr0* acts like a quantum eraser: we cannot know the path of the photons, if they go to *D1* or *D2*. This leads to the formation of interference fringes on the side of *A1* and *B1* on the detector *D0*.

So far nothing extraordinary compared to the experiences that have just been presented. However, what is interesting here are the distances between the emitting crystal and the detectors and, above all, the asymmetry of these distances: *D0* is very close to the crystal, while the four other detectors, *D1*, *D2*, *D3* and *D4*, are very far from it. In the original experiment, the distances are a few centimeters on the right and 2.5 meters on the left (symbolized by the dotted lines). We have conveniently increased these distances on the diagram and in the description of the experiment in order to strengthen the demonstration, but this does not change the

principle or the feasibility. Suppose therefore that *D0* is at 1 meter from the crystal and the four other detectors at 1000 meters.

Knowing the speed of propagation of the photons (the speed of light), it is easy to calculate the duration of their travel, respectively towards *D0* for *A1* and *B1* and towards *D1*, *D2*, *D3* and *D4* for *A2* and *B2*. The first path to the right will be 3 nanoseconds (billionths of a second) and the second path to the left will be a thousand times longer, or 3.33 microseconds (millionths of a second)[48].

This asymmetry in the duration of the paths causes the photons on the right (*A1* and *B1*) to interfere (or not) on the *D0* detector long before their entanglement brothers (*A2* and *B2*) have reached the detectors on the left *D1* to *D4*. We can have fun anthropomorphizing this in two ways:

1) we can say that *A1* (or *B1*) "predicts" the future of *A2* (or *B2*), since if *A1* (or *B1*) interferes, then *A2* or *B2* must, 3.33 millionths of a second later, reach the *D1* or *D2* detectors. Or again, if *A1* (or *B1*) does not interfere, then *A2* or *B2* must, 3.33 millionths of a second later, reach detectors *D3* or *D4*.

2) we can also say, otherwise, that *A2* (or *B2*), having arrived on the mirror *MsrA* (or *MsrB*) "knows the past" or "changes the past" of *A1* (or *B1*), joining *D1* or *D2* if *A1* (or *B1*) has interfered or joining *D3* (or *D4*) if *A1* (or *B1*) has not interfered, 3.33 millionths of a second ago.

We could also say that, when *A1* (or *B1*) comes into contact with *D0*, 1 meter to the right of the crystal, *A2* and *B2* know what their fate will be 1 meter to the left of the crystal. Which is in itself a problem because, from the quantum point of view, a wave-particle is neither wave, nor particle, neither here nor there, until it has interacted with a detector, a mirror or anything else.

And yet, it works so well! Quantum mechanics is never faulted, even when it leads us to the worst paradoxes or

strangeness. This "delayed choice" experiment (it is 3.33 microseconds later than *A2* (or *B2*) "decided" to go to *D1* or *D2* or to *D3* (or *D4*)), already confirms the non-locality: the entangled photons *A1-A2* and *B1-B2*, despite the spatial distance (1001 meters), form a "block," a unique system which explains this effect of "instantaneous remote communication." We could image this by taking a desk ruler 50 centimeters long: if you turn one end over, instantly the other end, 50 centimeters further on, also turns over. The two ends of the rule form a unit, a single system[49].

This experience also shows us that the same is true for temporality: the entangled photons appear to be in a temporal "block," a moment of eternity, in a way. A quantum system is not temporally separable, just as it is not spatially separable. We must consider that everything that happens from the emission of the entangled photons leaving the crystal, until their detection on the right as on the left, forms a temporal whole. It is as if, for entangled photons, a temporal block is formed, isolated from the general current of time, giving the impression of paradoxical effects like a photon "predicting" the future or "changing the past" of its twin.

Of course, beyond this idea of "spatial block" and "temporal block," we must beware of the illusions that appear when we look at all this from a "classical" point of view. Once again, the results of such delayed-choice experiments, however exact they may be, relate only to random phenomena, measured statistically, and which cannot be controlled. For example, the fact that the photons pass through or are reflected by the *MsrA* or *MsrB* mirrors is a completely random phenomenon, although its probability is 50/50. Currently, if we imagine that someone could, 1 kilometer from the crystal, on the left, place or remove the semi-reflecting mirror *Msr0* to make the interferences disappear or instantly appear on the right, on *D0*, it does not work! We still cannot transmit actions, effects, changes,

information, faster than light. And the "block" effects observed, spatial block and temporal block, are only given to us afterwards, when we calculate the correlations of the detections between all the detectors.

John Archibald Wheeler who, in 1978, had predicted the results of all these quantum eraser and delayed choice experiments, proposes to go further than a few meters or kilometers away from our small experiments on Earth (see the Fig. 13).

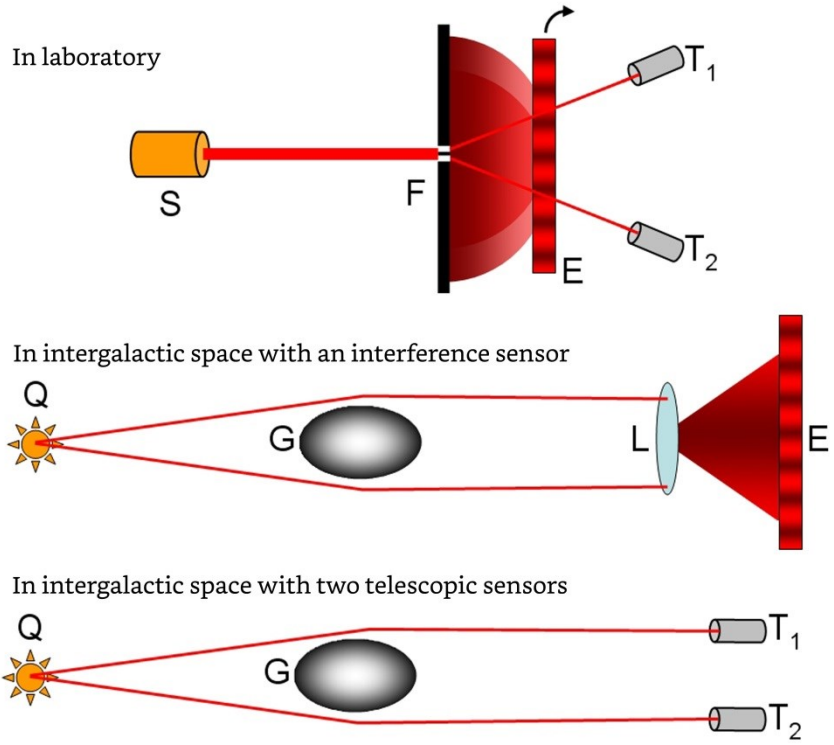

Figure 13: Wheeler's thought experiments, in the laboratory and in intergalactic space. Wheeler proposes to reproduce the quantum experiment, outside an earthly laboratory, in intergalactic space, over distances of billions of light-years. It will therefore be the decision of a terrestrial observer, to use a screen or two telescopes, which will determine at 1 billion light-years whether the same photon interferes with itself (as a wave) or passes through the either side of the galaxy *G* (as a particle).

Already, in the laboratory situation on Earth (or elsewhere!), we are now familiar with the classic experiment: a point source *S* of photons sends these particle-waves onto a mask provided with a double slit *F*. At the exit of the double slot, one can install either a removable screen *E*, or, having folded down the screen, install beyond it two small telescopes (T_1 and T_2) equipped with a sensor of photons and each oriented towards the exit of one of the slits.

The result is known and predictable: with the screen we obtain interference fringes produced by the two waves coming from one and the other slit, which means that each photon has interfered with itself, that it went through both slits at once. With telescopes, we detect the trajectory of the photons, if they have passed and, in this case, the photons pass through one or the other slit.

However, remarks Wheeler, just when they come out of the slits, before reaching either the screen or the telescopic sensors, the photons are indeed in a quantum indeterminacy, they are still particle-waves. However, it is indeed the later choice (even if it is played out in nanoseconds) of the observer, to fold down or not the screen which will determine if they will present themselves as "having passed through the two slits" (interferences on the screen) or like "going through a slit" (detection by one of the two telescopic sensors). It is as if the choice of the observer could determine, in the past, through which slit the photon will pass!

To make the experiment even more demonstrative, by leaving the time domain of nanoseconds to enter that of billions of light-years, Wheeler proposes to consider the same experiment, but this time on a cosmic scale. Consider, he says, a distant star, a quasar named *Q*, say two billion light-years away. A photon leaves this quasar in the direction of our planet Earth, but on the way, this photon encounters a massive galaxy *G* halfway, say a billion light-years away.

According to Einstein, by gravitational lensing, this galaxy will act as a cosmic magnifying glass and will cause the photon to go through two different paths on either side of the galaxy.

Assuming, in this thought experiment, that the two paths followed by the photon are of equal length, an earthling can observe this photon using a telescope, therefore an *L* lens, equipped with a screen *E* of detection (type photographic plate or electronic sensor), which will give a figure of interference of the photon with itself (in fact, the interference fringes will form as and when many photons arrive from this same star), photon then passing through both paths at the same time. Now, if instead of a telescope with a reception screen, our earthling uses two telescopes (T_1 and T_2) pointed on either side of the galaxy, he will observe the photons passing through one or the other way. However, there again, it is the choice of the observer which seems to determine, **a billion years in the past**, by which path the photon will pass or if it will interfere with itself, passing by both paths at the same time.

But Wheeler goes even further! At "first" (it is a way of speaking, at "first" we are out of time… and space), the potential universe then comes down to a wave function, which can be represented as a single particle the size of the Planck length, i.e. 10^{-35} meters. This wave function will collapse, it is the Big Bang, 13.7 billion years ago, giving a "classic" universe of particles-waves (sometimes particles, sometimes waves), in expansion. **And it is the fact that there will be, 13.7 billion years later, information sensors, observers of the universe, which would have caused the collapse of the wave function, the Big Bang, the expansion, our whole "classic" particles-waves universe!**

Indeed, to spatial non-locality we must now add "temporal non-locality." Not only are the foundations of the universe not inscribed in a spatiality, but they are also not inscribed in

a temporality, and therefore, in a causality. The foundations of the universe therefore form a "block," outside of space and time, the latter being only the conditions of "spatio-temporal" updating of this "block" by its interference with itself. **It is as if the universe as a whole "passed through the two slits, the two paths" to interfere with itself, giving the interactions, the information sensors, the consciousnesses...**

ONTONOMIC IMPLICATION

Within the framework of the informational ontonomic matrix model, experiments of the "delayed-choice quantum eraser" type show us that the information of entanglement and temporality are decoupled. Thus, entangled quantum systems of large spatial size also exhibit a temporality independent of the ambient temporal flow. Just as an entanglement system is in a spatial block (which gives the impression of action at a distance from our "classical" point of view), such an entanglement system is also in a temporal (or timeless) block (which gives the impression of simultaneity, "faster than light" from our "classical" point of view).

Quantum synthesis

In 2012, Florian Kaiser, Thomas Coudreau, Perola Milman, Daniel B. Ostrowsky and Sébastien Tanzilli, from the CNRS[50], carried out a "delayed choice" type experiment in a Mach Zehnder interferometer (see the quantum eraser experiment), in order to observe wave-particle superposition states. The researchers used a pair of polarized and entangled photons, one of these photons being used to test the state of the other entangled photon, between wave and particle. In addition, the experimental protocol was delayed choice, separating the test photon system and the control photon system, thanks to an optical fiber 105 meters long! The two systems being, moreover, separated in different laboratories

simply connected by the optical fiber (which conducts the photons). There is therefore a delay of 20 nanoseconds in the detection of the two photons and the calculations have clearly shown that there is no causal connection between the two photons, they are entangled in a non-local space-time.

The results of this beautiful experiment showed that by playing on the polarization angle of the test photon, the control photon could present states sometimes wave, sometimes particle, but also all the combinations of these two states. This means that we must get away from a vision that is a little too "classical," naive and binary, the "sometimes wave," "sometimes particle." The photons, the electrons, all the particles, all that exists, is not sometimes wave, sometimes particle, but is permanently both wave and particle in various proportions. What is well represented in this graph (Fig. 14) which shows the quantified results of the experiment in a visual form.

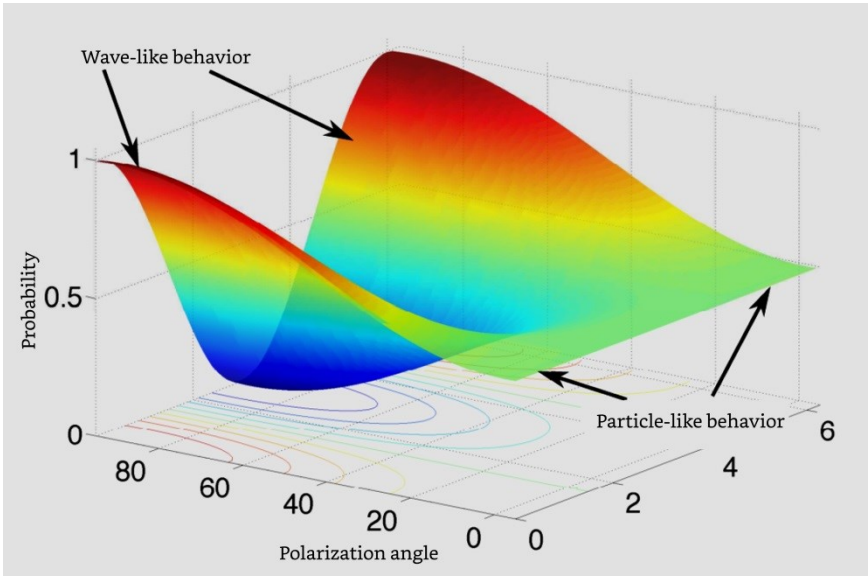

Figure 14: Kaiser et al. experiment, CNRS, 2012. The results of the quantum experiment do not show a sudden wave/particle changeover, but rather a gradual transition between the two states, or even superimposed wave-particle states.

Within the framework of the informational ontonomic matrix model, the playing of the matrix information translates into particle-wave, in the sense that everything is only particle-wave and not only "sometimes wave, sometimes particle." As we said following Young's double-slit experiments, "at first," in the sense of what the playing of the matrix produces at the base, these are oscillating force fields, waves. But these waves also contain, "at first" their "particulate" potential, which will be actualized by the interaction of the waves between them. And this actualization itself is not binary (sometimes wave, sometimes particle), but continuous, quantum objects can really be both wave-particle, particle-wave, in variable proportions.

Moreover, the information of the matrix is limited to giving only "states" of what exists, between being "particle," being "wave," being "particle-wave" in variable proportions. And, as we know now that, starting from the wave state, what is actualized in particle state results from the interference between the waves, we can deduct from it that the matrix also contains the information of interaction. In summary, the informational ontonomic matrix contains information on the wave-particle state and interactions between the waves, these two informational elements, states and interactions, being obviously linked, they depend on each other: the states depend interactions.

The tunnel effect

To get an idea of what the playing of the matrix produces, we can look for a moment at the beautiful images given by scanning tunneling microscopes. But for that, it is good to understand what the "tunnel effect" is. With the diagram (Fig. 15) everything will seem very simple to you.

A scanning tunneling microscope is made up of a very fine point which practically ends in a single atom. This tip flies up and down (scanning) over a surface, for example, a copper

plate, therefore a layer of copper atoms. An electric voltage is applied between the tip and the surface and the distance between the tip and the surface is precisely calculated so that the outer electrons of the copper atoms reach the tip. This passage of electrons in the tip is a quantum effect, this is called the tunnel effect (as if a "tunnel" formed between the copper atom and the tip, through which the electron passes). This tunnel effect occurs at a specific distance (too far, the tunnel effect disappears, too close, the atom sticks to the tip, which also allows it to be moved).

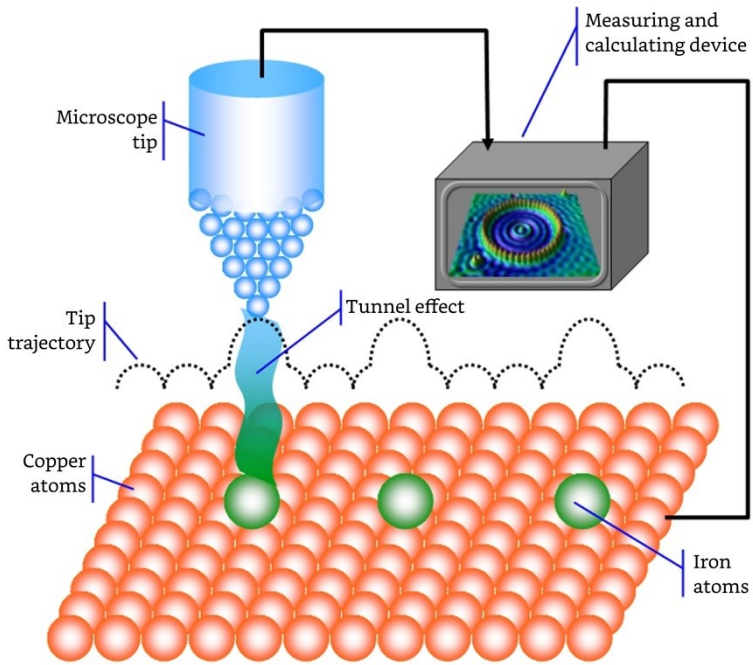

Figure 15: By scanning the copper surface at the right distance to produce a tunnel effect, we can record the state of the surface and any atoms placed on it (here iron), like a sonar scanning the bottom of the ocean.

To scan the surface, line by line, the tip is held at the right height above the copper atoms, which makes it possible, a bit like a ship's sonar scans the seabed, to obtain the topological profile of this surface. And, of course, if there are other atoms

(iron atoms on the diagram), the tip will rise and their profile will be recorded. A computer continuously measures the height of the tip and calculates an image which results from the complete scanning of a given surface. The computer can then add shades of gray or colors based on the recorded heights. Of course, neither atoms nor electrons have colors (colors are an interpretation of the world by our brain), it is just to facilitate understanding the images and it is so much more beautiful! Here is a first result (Fig. 16).

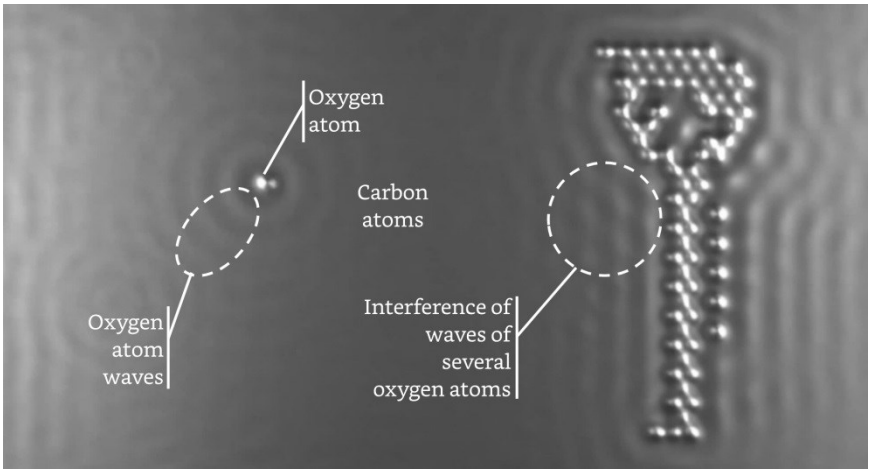

Figure 16: On this image produced by tunnel effect, we can distinguish both the atomic nuclei (here oxygen) and the electronic waves which surround them and which interfere with each other.

This image is taken from a small animation produced by IBM laboratories[51]. The little character made up of oxygen atoms on a carbon slide does not matter, what interests us is to see the oxygen atoms and above all what surrounds them. Because what is important here are the electronic waves which surround the atomic nuclei (what we actually see are the electrons most closely linked to the atomic nucleus and which allow it to be located), as we can see for the lone atom on the left. On the right, several atoms being close to each other, we can see that these waves form interferences.

Another image (Fig. 17) offers an even more striking vision of the constituents of matter.

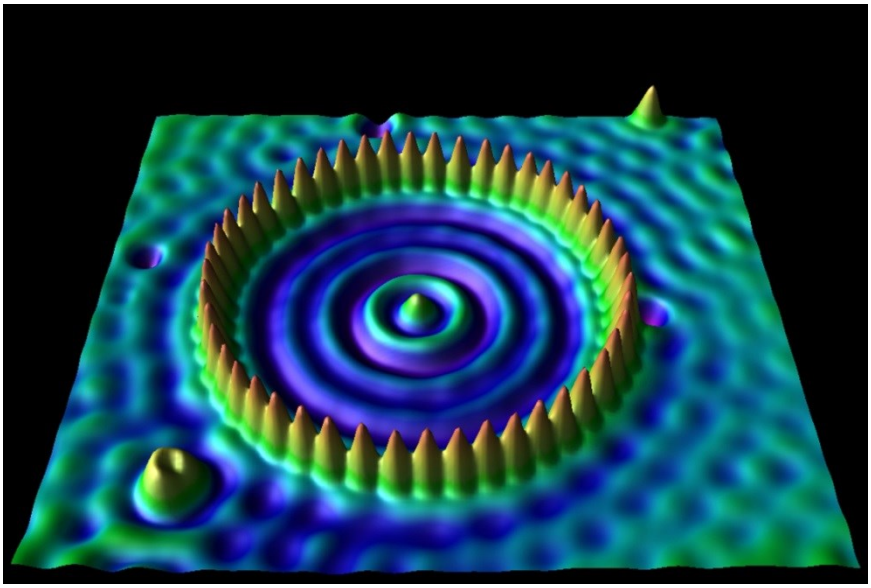

Figure 17: Very demonstrative quantum interference of electronic waves of a circle arrangement of 48 iron atoms.

Here, 48 iron atoms have been arranged in a circle (using the moving function of the scanning tunneling microscope). The circle is 14 nanometers (billionths of a meter) in diameter. Here too, the "peaks" correspond to the electrons which are the most bound to the iron nucleus (which makes it possible to locate these atomic nuclei of iron), the other electrons, less bound, because on more external orbits of each iron atom, form interferences. Outside the circle, the interferences form small regular hollows and bumps. While inside the circle, the interferences form concentric circles.

These images clearly show us that the information resulting from the playing of the informational ontonomic matrix first "produces" wave systems. Whether they are fermions (electrons, muons, tauons, neutrinos, quarks,

neutrons, protons…) or bosons (photons, gluons, Z, W and Higgs bosons, gluons, gravitons…), all these fundamental particles and their respective anti-particles (and all those that we will discover in the future) are above all of a wave nature, the "particulate" effects resulting from the interactions of these waves between themselves or with themselves.

The informational ontonomic matrix has another important characteristic, which quantum experiments have clearly shown us: it does not contain spatialization information (extension in a three-dimensional space) or temporality (extension on a past-present-future time vector). In fact, experiments at the quantum level show us a spatial non-locality (a system can be extended indefinitely in space and yet present a simultaneity of change of state at a distance); but still a temporal non-locality (a system can be extended indefinitely in space-time and yet behave as if it were out of common time and as "predicting" its evolution from the past or as "changing" its past depending on its future state).

These experimental results, in quantum mechanics, clearly show us the nature of this informational ontonomic matrix: it is not in a spatiality nor in a temporality. It is outside space and time, hence the quantum effects of the spatial "block" type and temporal "block" type, which manifest themselves when one goes to browse in the deepest, most fundamental of matter-energy, particles-waves. As for space and time, they are the modalities of playing, of interpretation, of this matrix by a consciousness.

Consciousness is spatiotemporal, not the matrix. We can take a metaphor here, that of the film engraved on a DVD disc: the matrix of information engraved on the DVD is not in the space and time of the film and it is the playing of the DVD which produces the space and time, in the film. The information of the DVD does indeed form a "block" outside the space-time of the film. And the quantum experiments

would be like experiments that the characters in the film would perform in order to begin to grasp the nature of the DVD from which their film-universe is created.

The Casimir effect

We have just seen how matter-energy, as it manifests itself on our daily scale, as solid things, particles, is ultimately reduced to systems of particles-waves. But what about emptiness? This is where, after the tunnel effect, the Casimir effect will bring us an astonishing answer and allow us to specify one of the fundamental properties of the informational ontonomic matrix. The Casimir effect comes from Hendrick Casimir who predicted it in 1948[52]. Subsequently, numerous scientific experiments demonstrated it. The diagram (Fig. 18) simply explains this effect.

This experiment consists in placing in an empty enclosure (there is no longer any gas inside), two conductive plates, but not electrically charged. These two plates are placed parallel to each other at a very close distance. The result is that an attractive force appears between the two plates, they attract each other, this force depending both on the surface of the plates and on their proximity. How to explain such a phenomenon?

Classical physics is of no help here. On the other hand, quantum physics explains this force of attraction from "the energy of the vacuum" and the quantum theory of fields (of wave systems). In fact, the "vacuum" is not strictly speaking... empty. The vacuum is filled with energy in the sense that it is populated by invisible particles-waves, because their lifespan is far too short. The vacuum therefore has a potential for the spontaneous creation of particles-waves, virtual particles. These particles-waves, which appear and disappear, are called the quantum fluctuations of the vacuum.

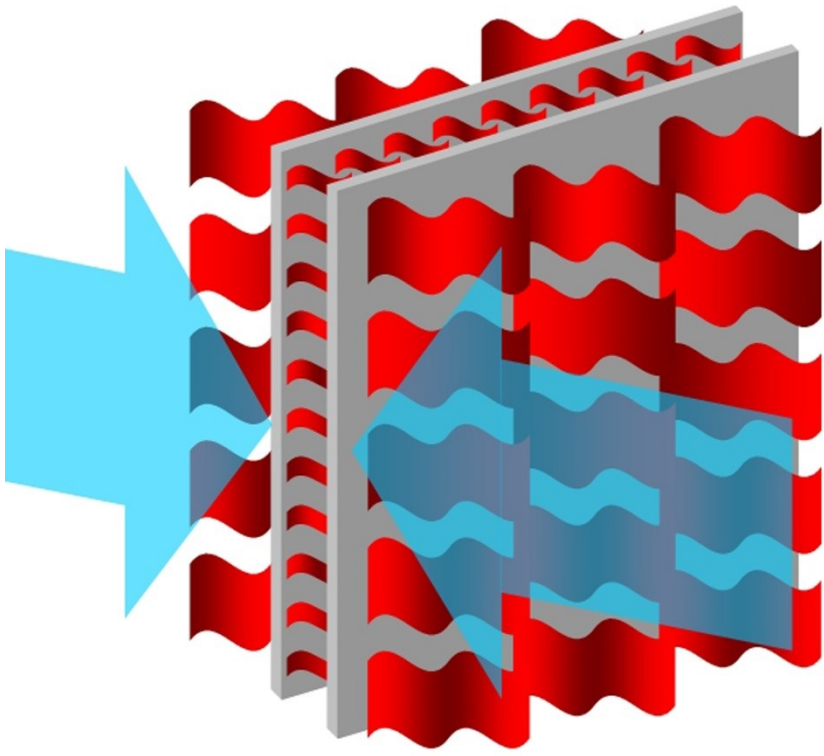

Figure 18: Two conductive plates (but without electrical charge), placed very close to each other in an empty enclosure, attract each other. This is the Casimir effect, which is explained by the energy of the vacuum, within the framework of a quantum field theory.

As far as the Casimir effect is concerned, both the real photons, present in the enclosure, which are emitted by the walls of the enclosure and the plates themselves are taken into account; and virtual photons related to quantum vacuum fluctuations. Outside the plates, in the enclosure, the photons, real and virtual, are numerous and of all wavelengths (the large undulations on the diagram). Whereas between the two plates, due to their proximity, the small space which separates them, the photons are limited to those whose wavelength is equal to or less than the distance

between the two plates (the small undulations in the diagram). This condition, of course, greatly reduces the number of possible photons between the two plates. The consequence is that there is more vacuum energy outside the plates and less energy between the plates. It is this energy differential that produces the force of attraction between the two plates (symbolized by the two large arrows).

The Casimir effect, which demonstrates the energy of the vacuum, derives from quantum field theory, which sees all fields (magnetic, electric, electromagnetic, weak and strong nuclear forces, gravity, etc.) as quantum weaves. The image usually used is that of balls, all connected to each other by vibrating rubber bands, a bit like in the diagram (Fig. 19).

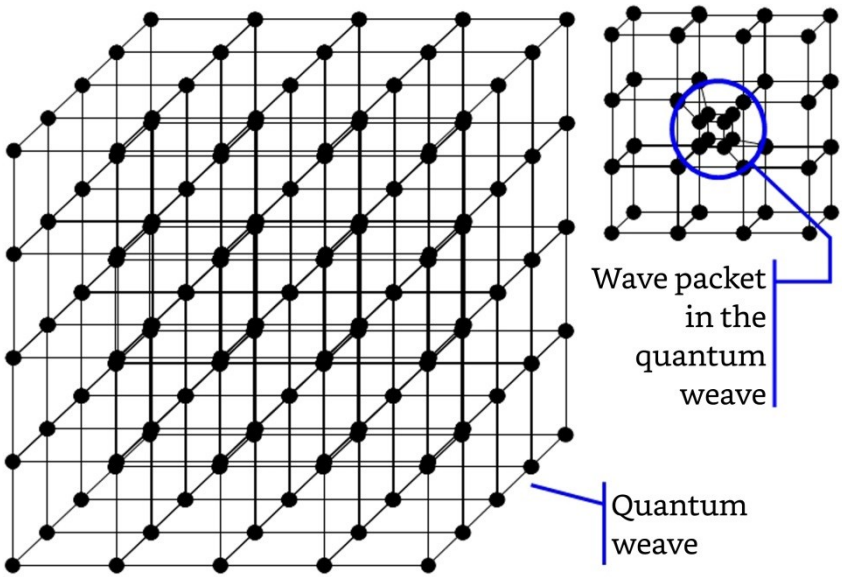

Figure 19: In quantum field theory, the fundamental elements of reality are the fields that fill space. It is from these fields that the phenomena of our daily reality are born such as particles, matter, movement, force, force fields...

You have to imagine an infinite network of these balls, let's say in addition, in three dimensions. A block of balls. In this network, what is called a wave, a particle, a field, a force,

energy, results in vibrations, condensations, dispersions, which bring the "balls" closer or further apart, form packets or very sparse areas. The packets propagate like waves and all this translates into our daily reality as particles, matter, movement, force, force fields.

A marble falls to the ground. Stop seeing this marble as a "marble," an object. It is basically a bunch of these quantum "balls," moving through the weave like a ripple on the surface of the water. When you throw a stone into the water of a pond, concentric waves form and extend to the edges of the pond. The water molecules that form these waves do not move relative to each other, they are simply lifted and then lowered, while remaining in elastic contact with each other. It is the same for the marble from the point of view of the quantum weave. It is the same for your hand, your whole body, a vehicle, a planet, a star and everything that exists in the universe.

The marble that you drop on the ground, in the quantum weave (field), is a wave packet. The vibrations of this quantum weave (this field) propagate according to the wave equation appropriate to each field. For your marble it is the gravitational field. For a photon it is the electromagnetic field and so on. All field excitations correspond to elementary particles-waves of particle physics. Thus, the vacuum itself has all the properties of a particle-wave: energy, frequency, amplitude, polarization, spin. And all it takes is a condensation of this vacuum for a wave to form, and all it takes is an interaction of this wave with itself or with another wave for a particle to appear.

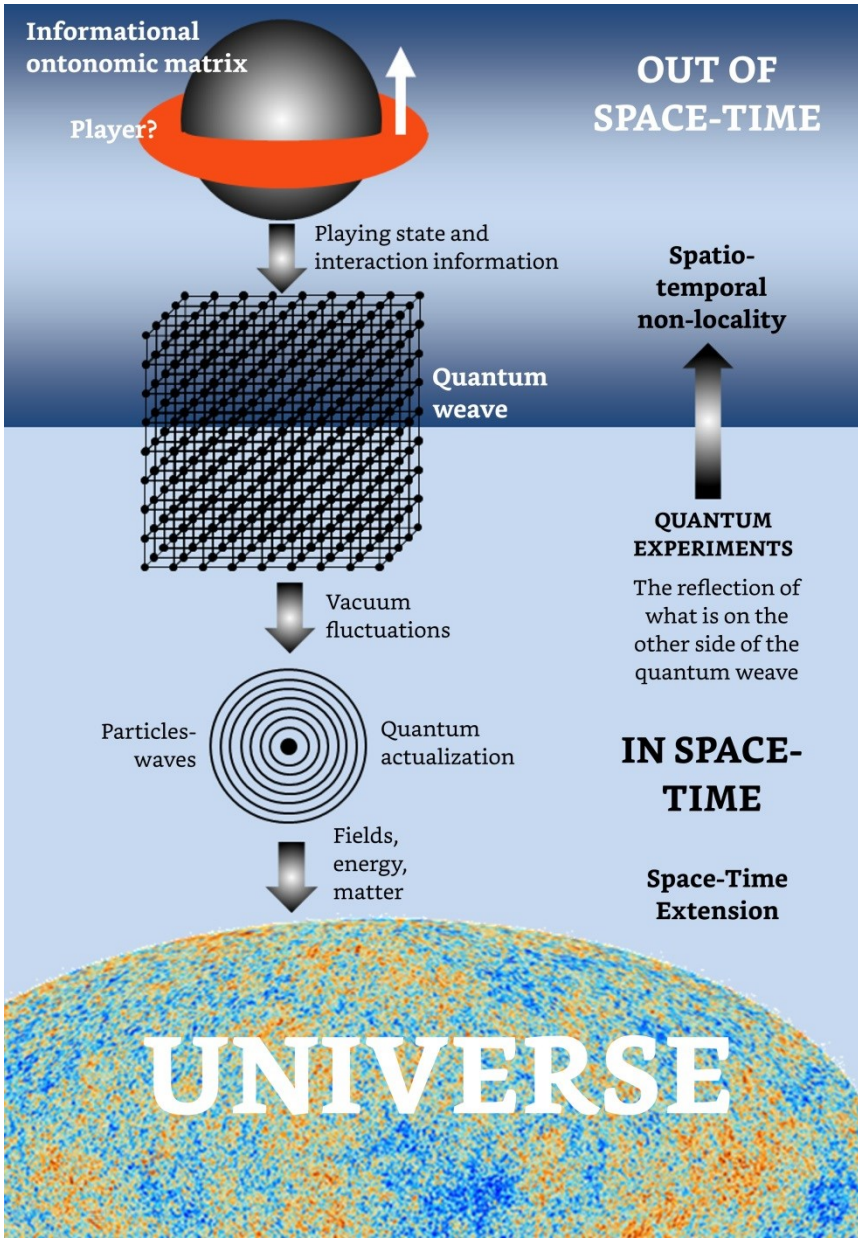

Figure 20: This diagram represents all that we have been able to analyze so far of the informational ontonomic model. Conceptually, the quantum frame is at the interface between, on the one hand, the matrix underlying reality, outside of time and space (which the strange results of quantum experiments reveal to us) and, on the other hand, the space-time phenomena, which form the universe in which we live.

If we summarize (see the diagram, Fig. 20), we have a quantum weave, a block of "little balls," which are all connected to each other by "elastics," flexible links, which allow "balls" to vibrate in relation to each other, to move away, to approach, creating waves in the network of "balls." But what is the relationship between this quantum grid and the matrix informational ontonomic s? With the quantum weave, we are already in space-time, in the void and its energy which is actualized in force fields and particles. However, we know, according to the results of quantum experiments, that what is hidden behind the energy of the vacuum, the quantum weave, is outside space and time. The quantum weave is therefore not the ultimate element of the model and one must clearly differentiate this frame and the informational matrix.

In our diagram, the quantum weave is at the interface between non-locality and spatio-temporal locality. Outside space-time is the informational ontonomic matrix. This matrix contains the information that will allow the unfolding of the universe.

We will see later the nature of this information. Out of space and time, and moreover, being simply information, what is the matrix cannot be energy, fields, matter, movement, speed, in a word, phenomenon. To return to the analogy of the DVD, the information contained on the DVD is not in the space-time of the film which will be produced by playing this DVD. But if the characters in the film decide to carry out "quantum experiments" to understand the origin of their universe, they will have to get as close as possible to the bits of information from the DVD. Of course, just like us humans in a phenomenal universe, we cannot touch the informational matrix, they cannot reach the DVD. However, with the appropriate experiments they may be able to begin to get a sense of this underlying information, starting with its non-locality.

There is therefore a "reading" of the matrix. Necessarily, since it is this playing that will give:

– time (the playing being sequential, by Planck duration);

– space (per matrix layer of one quanta, with a length of Plank);

– the existing (particles-waves);

– and movement (interactions).

Who is playing the Matrix? For the moment, we will limit our model to a question mark on this question. Our analysis can be described as "playerless," because we do not yet take into account the player. Later, we will take up this question to try to answer it. But if you have been attentive to the contributions of Mādhyamaka, you will easily guess that playing of the informational matrix has to do with consciousness…

If we go back to the description of the global informational ontonomic model, the playing of the matrix gives space-time and the quantum vacuum, the quantum weave, which contains the potential of the whole universe. It is the fluctuations of the vacuum, following the information of the informational matrix, which create the fields of force, the wave systems, the particles. It is this quantum actualization which results in the expansion of the universe in which we are. Universe in which the genius of man led him to carry out quantum experiments, to probe matter-energy to discover the reflection of what is on the other side of the quantum weave… the MATRIX!

However, you must not be mistaken about the representation of the universe[53] in the diagram above. There is not a "place" with the informational ontonomic matrix and an "other place" with the phenomenal universe. The illustration should be understood as a diagram intended to explain ideas and not an overall representation of what exists. In fact, you have to see the matrix as not being in a

given place, it is nowhere, but it is the foundation of our universe as a block of information, the playing of which produces the universe, space-time included. In this sense, there is no space-time outside the universe, there is nothing outside the universe, apart from other universes… Which we will see soon.

The informational matrix is not "out-of-universe" (or the opposite). The matrix is simply the information side of the quantum weave and the universe is the actualization side of the quantum weave. You take a sheet of paper: the sheet is the quantum weave, the front is the informational matrix, the back is the actualized universe. The sheet, its front and its back are the same thing and there is nothing else outside this sheet and its front and its back (apart from other sheets, which are other universes…).

Quantum interpretations

In science, the models, the theories, confront each other courteously (which does not prevent passionate debates) and the best are those who are able to explain the facts as simply as possible, and above all, to predict them. This, while retaining although in science, theories are always doomed to disappear, to give way to a more advanced competing theory, capable of better taking into account the facts, of making better predictions.

In quantum mechanics, the facts are disturbing, counter-intuitive, beyond common sense, so that many models are in competition in the scientific community and fuel many debates. Researchers position themselves on this or that model, certainly according to their reason, but because of the complexity of the phenomena and the explanatory theories at stake, often according to their… cultural background, to sum things up simply. In quantum, theories and speculations are often very close and sometimes intertwined. Quantum mysticism lurks and is never far away…

From the point of view of the model of the informational ontonomic matrix and with regard to the results of quantum experiments, the quantum problem can be summarized in three points:

1. the playing of the matrix actualizes a particle-wave duality;
2. the playing of the matrix actualizes the states (entanglement, direction, amplitude, frequency, polarization, spin, etc.) of a particle-wave duality which is dissociated from any spatialization (spatial non-locality);
3. the playing of the matrix actualizes the states (entanglement, direction, amplitude, frequency, polarization, spin, etc.) of a particle-wave duality which is dissociated from any temporalization (temporal non-locality).

From there, we will quickly present three models which have a fairly broad consensus in the scientific community: one not to be entirely retained, the other two because they open up perspectives in accordance with the Buddhist metaphysical approach, which will allow us to understand what the informational ontonomic matrix is and how its design can help us to change universe.

The Copenhagen model

This so-called "Copenhagen" interpretation of quantum phenomena was proposed by Niels Bohr, Werner Heisenberg, Pascual Jordan and Max Born[54]. The name of this interpretation comes from the Copenhagen Physics Institute headed by Bohr.

In this model, the separation, which classical science usually conceives, between the measured object and the measuring instrument is called into question. When we arrive at the atomic, quantum scales, the measuring instrument becomes not only a parameter to be taken into account, but also a variable which has its influence on the

experimental process itself. We have seen how, for example, a simple photon detector can indirectly influence entangled atoms, even at great distances.

Classical science maintains the idea that the universe can be described without taking into account the observer and his instruments of measurement and detection. For the Copenhagen model, this idea is an illusion, not that the mind of the physicist influences his experiments, but rather it is his experimental devices, his detectors, his screens, his mirrors, which have an influence and lead to an inevitable uncertainty in the results obtained. In fact, nothing has ever been observed in science, and especially in quantum science, without going through measuring devices, so that the "classical" separation between the identity of the observed/measured object and the identity of the measuring device disappears, just as the identity of two entangled objects disappears in quantum experiments.

The fundamental particles form a universe of potentialities, of possibilities, they are not, at the base, objectively and independently observable facts. What is observed is the actualization of coincidences between the phenomena and the observer, via his measuring devices.

This vision of the universe offered by the Copenhagen model is interesting, because it is completely in line with a Nāgārjuna's concept of emptiness and his tetralemmas: phenomena are not really consistent, nor permanent; they are interdependent and condition each other causally; they are inconsistent, appear and disappear; their identity is not certain because of their composite aspect (they are composed of other phenomena and compose other phenomena). All this without mentioning the emptiness of the observer's ego…

However, the Copenhagen model may have drifted towards an overly empirical view which has prevented it, and continues to prevent it, from advancing towards bolder implications and models. Indeed, this school of thought

maintains that it merely describes, but does not explain anything. Quantum mechanics is only a simple tool for predicting experimental results and mathematical formalism is only an intellectual tool that does not imply any underlying "reality." What quantum mechanics entails is so unusual and complex that many physicists prefer not to think about it, considering it "metaphysical speculation." The whole of quantum mechanics, as theory and mathematical formulas, would only be an intellectual tool and nothing else.

In particular, the Copenhagen model refuses to say that photons, electrons or other particles-waves really exist, refuses to apply to quantum phenomena the classical spatio-temporal conceptions and images, which are usually given to other phenomena of reality, let's say, macroscopic.

Admittedly, this conceptual prudence of the supporters of the Copenhagen model is commendable and it would not be denied, ultimately, by a Buddhist Mādhyamika and his tetralemmas who, in the same way, refuse to take sides for any "reality." However, intellectual abstinence finds its limits when it makes us run the risk of missing out on other conceptual advances. And a Mādhyamika Buddhist, however fervently adept of emptiness he may be, will never renounce further work of reason to better understand phenomena and thus better detach himself from them.

Many physicists, and not the least, like Einstein, Schrödinger, De Broglie, Planck… showed themselves very dissatisfied with this empiricism of renunciation and were keen to imagine experiments capable of advancing the debate and, above all, to deepen our vision of the universe. The following two models are attempts.

The De Broglie-Bohm's model

This model was first proposed by Louis V. de Broglie and later developed by David Bohm and other physicists such as Basil J. Hiley and John S. Bell[55]. The goal being to give

quantum mechanics an interpretation that is both realistic and easily imaginable[56].

In this model, each particle is associated with a wave, a "pilot wave," in the sense that it "guides" the particle, it has an influence on its movement. For this approach to quantum mechanics, the wave function is not just a pure mathematical entity (Copenhagen model), but a wave system, a completely "real" field (within the limit of what we consider as "real"). As for the particle, in this model it is independent of the pilot wave, while being guided by it. In any case, the particle is a reality, with a position in space, a movement and a speed.

Faced with the question of probability, which stems from Heisenberg's principle of indeterminacy (remember: we cannot know both speed and position of a particle, the photon or the electron is everywhere at the same time in its wave and only manifests itself at such and such a place according to a probability linked to the wave function), the Bohm model explains that this uncertainty only concerns local aspects of the universe (such as the context of a scientific experiment in a laboratory), but does not concern the universe as a whole.

The random and unpredictable aspects observed (for example, the photon passes through the semi-transparent mirror or is reflected by this mirror) are only an appearance of randomness, of chance, because we observe a very small portion of universe. At the level of the global wave function of the universe, there is no more randomness.

Thus, in all quantum experiments where a non-locality effect appears, it is as if the particle "knows" when there is a detector that comes into action or not. Of course, the fact of putting the verb "to know" between quotation marks tells us that this is not a personalization of the particle. What is meant by the proposition "the particle knows" is that the non-locality concerns not only the wave-particle studied, but

also the experimental device, the laboratory where the experiment takes place and, finally , the entire universe. It is here that the De Broglie-Bohm model introduces the idea of a "quantum potential."

The quantum potential is a central concept in the De Broglie-Bohm model, a concept which was developed in particular by Bohm and Hiley. In fact, it is a question of answering the question of the guiding link between the particle and its pilot wave. And how, from the wave, the particle manifests itself, in such a way and in such a place. The Copenhagen model called this phenomenon "wave function collapse" or "reduction of the wavepacket." One can easily explain the thing by saying that, as long as no detector or measuring instrument enters the scene, the particle is everywhere at the same time in the wave, it passes through the two slits, to resume the Young's experiment. But as soon as a detector appears, this wave where the particle is everywhere at the same time "collapses," "reduces."

One could take here the analogy of the condensation of water. The water vapor produced by the water in a shower or a bath condenses on the cold glass of the bathroom mirror. Each drop of water results from a finite amount of water vapor. Suppose the shower or bath emits only a limited amount of steam to form a single drop. At the steam stage, we see nothing, we detect nothing (as a reminder, water vapor is an invisible gas and when you see it, it means that condensation has already started, in the form of very fine droplets floating in the air). In our analogy, the vapor is to the drop of water what the wave is to the particle. Then, the cold mirror enters the scene (the equivalent of the detector for the wave) and there, the mini cloud of water vapor will "collapse," "reduce" on the surface of the mirror, condensing in a "particle" drop of water. Please note that this is an illustrative analogy to allow you to imagine what the "collapse of the wave function" or the "reduction of the wavepacket" can be at the quantum level.

For the Copenhagen model, the wave/particle ratio is explained by the "reduction of the wavepacket," which leads to seeing things in a dualistic way: either there is a wave, or there is a particle. However, we have seen that this is not exactly what the most advanced quantum experiments show. Rather, we are dealing with a wave-particle continuum with mixed wave-particle, particle-wave states in variable and continuous proportions.

For the De Broglie-Bohm's model another explanation is put forward. There is a "quantum potential," which represents an "information field" underlying the particle-wave system and whose "shape" determines if and how the particle-wave system manifests as a wave, a particle or a little of both and, if it is a particle, what is its trajectory, what slit it will pass through, whether it will be reflected or not, whether it will interfere with itself or not.

For Bohm and Hiley, it is not information as we usually hear in our everyday environment. The information we are talking about here is underlying the wave, as if the wave itself became a field of information. What is this underlying information? Bohm and Hiley talk to us about it in terms of "holomovement" or "implicate order" (as opposed to explicate order, as we observe it in classical mechanics or in the quantum theory of "reduction of the wavepacket"), even "protoconsciousness!"

The spatial and temporal non-localities thus find an explanation by this underlying information: if the entangled photons react as a single system at very great distances, it is because they are determined by this underlying information, this implicate order. This underlying information does not only manifest itself at the microscopic, quantum level, but also explains still very mysterious macroscopic phenomena, such as cell differentiation in biology, the holographic dissemination of information throughout the brain in

neurobiology, up to the metaphysical problem of individual solipsism in its relation to a universal consciousness.

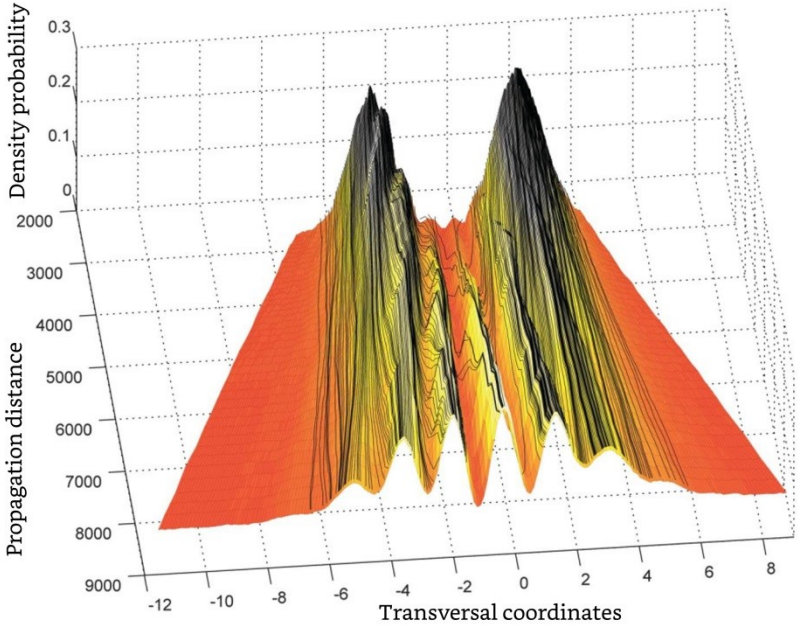

Figure 21: In this double-slit type experiment, with individual photons, two packets of trajectories are observed, showing that there is both interference and a determined trajectory. The photons would therefore be well guided by their pilot wave.

Moreover, for Bohm and Hiley, the relationship between this underlying information and the universe as it manifests is holographic. The implicate order is a hologram of the universe and unfolds to actualize the universe, the explicate order. And, for example, in Young's double-slit experiment, if the wave passes through both slits and interferes with itself at the exit, the particle only passes through a single slot. Before the slits, the particle is potentially everywhere in the wave. However, as soon as an obstacle appears, such as a screen with two slits, the particle leaves its "potentially everywhere" state and actualizes itself "somewhere." The

particle moves from a "potential" state, underpinned by the underlying implicate order information, to an "actualized" state. Moreover, a major experiment in quantum physics[57], carried out in 2011 by Sacha Kocsis and his collaborators, clearly showed in a device of "double-slit" type, that the average trajectories of the photons confirm this passage through one or more other slit (see Fig. 21).

In this experiment, the double-slit effect is produced using two optical fibers which split the photons. A "weak" detection system is used to measure the passage of a photon by one or the other fiber before the interference on the detector screen. Note that this is a photon-by-photon experiment. The analysis of the impacts at the level of the interference fringes, coupled with the "weak" detection, made it possible to identify the "average trajectories" of the photons.

These do indeed form two packages of trajectories, which can be interpreted both as something that interferes (the wave function of the photons) and something that follows a determined trajectory, by one or the other fiber (the photons). The photons would therefore be well guided by their pilot wave.

ONTONOMIC IMPLICATION

The De Broglie and Bohm's model approaches the notions of wave and particle in a realistic and deterministic way. The indeterminate, the random, are the effect of a partial consideration of the universe (like an experiment in a laboratory, with measuring instruments). From the point of view of the global universe, there is no indetermination, nor randomness, because everything is already determined in an implicate order, an information underlying the universe. This information gives a quantum potential, which actualizes the particles from the waves and from the local conditions which, themselves, are determined by the implicate order. This

"implicate order," corresponding to an underlying "information," which entirely determines the universe, corresponds to what we have called the "ontonomic informational matrix." The De Broglie and Bohm's model indicates to us, moreover, that there is a holographic relation between this implicate order and the explicate order, that is to say between the matrix and the actualized universe. And, to further prefigure the question of "what plays" this information from the matrix, Bohm and Hiley speak to us of a "protoconsciousness," that's progress!

Everett's model

The Hugh Everett's model[58] (supported by David Deutsch[59]) is, like the De Broglie-Bohm model, a realistic model, which calls upon a concrete representation of things[60]. This model is intended, at the outset, to respond to the problem measurement in quantum mechanics: what exactly do we measure? What meaning do the measurements and the data collected by the detection instruments have, when faced with entangled states? Can we really measure something in a particle-wave system?

Quantum phenomena such as **entanglement** (two particles, two atoms, two molecules, etc., entangled can present an identical evolution of their physical properties, even separated by a large distance – non-locality), the **probability of presence** (a photon , an electron, are not really in a well-defined place, but in an area – wave function – where they can be present according to a certain probability), the **superposition of states** (a particle, a pair of particles, an atom, etc. can be in a quantum state with several values and, for example, they can be in several places at the same time – probability of presence), all these phenomena raise the question of their interpretation.

For the Copenhagen model, these questions are evacuated by saying that they are false questions, that quantum

mechanics only accounts for these phenomena, but does not seek and does not have to seek explanations more deep, a priori unknowable.

For the De Broglie-Bohm's model, these questions are legitimate and need to be asked and we must strive to deepen quantum mechanics to try to give them an answer. The "deeper" explanations are knowable! One of the answers, provided by the De Broglie-Bohm model, is that there is an implicate order, an underlying information, which explains quantum phenomena.

We are going to see that Everett goes even further and, not only does he agree in saying that quantum questions are legitimate and that we must strive to ask them and answer them, he agrees in saying that there is "underlying information," which explains quantum phenomena, but in addition, Everett will attempt to explain the structure of this implicate order, of this underlying information.

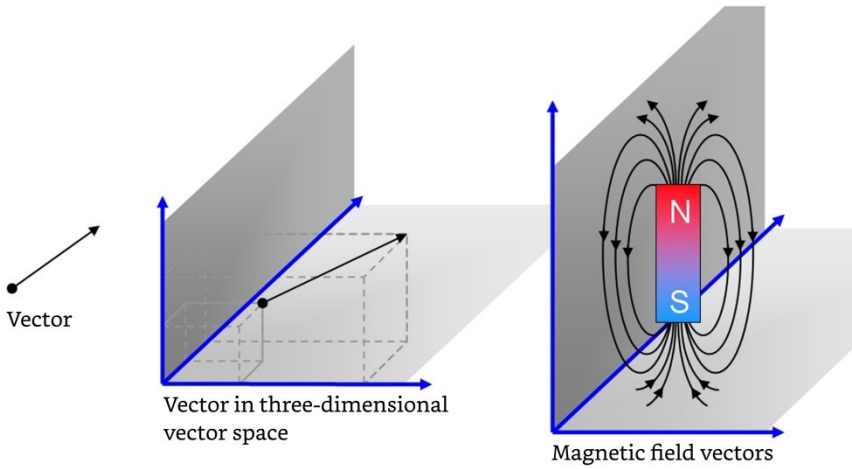

Figure 22: A vector is a mathematical representation, in the form of an arrow, with its origin, its extremity, its length, and its direction, all in a vector space, which can be flat or multidimensional.

Remember, in the introduction to this book, we told you that for quantum mechanics, the particle-wave duality (in other words the universe) can only be described as a "state vector in a Hilbert space." What does all this mean?

– A **vector** (Fig. 22) is a mathematical representation and tool, in the form of an arrow, with its origin, its extremity, its length, and its direction, all in a space (which we calls for this "vector space"), which can be flat (like a sheet of paper), three-dimensional (like the space contained in a box) or with more dimensions, even an infinity of dimensions. The vector therefore represents a set of numerical values (for example, one of the lines of a magnetic field, which emanates from a magnet, can be described as a vector having an origin, a direction, a force… in three-dimensional space).

– A (quantum) **state** is a set of physical quantities that characterize a quantum object (for example, position, movement, direction, spin, etc.). As a state takes into account several things at the same time, we see that vectors are quite suitable for describing them.

– A **Hilbert space** is a vector space, comprising an infinity of dimensions, themselves infinite and forming as many infinite subspaces, it is therefore a mathematical tool in which take place the vectors which define the quantum states.

What is called the "dimension" or the "dimensions" of a space are the elements which make it possible to locate each point of this space. For example, in the space of our daily life, objects are located in the three dimensions of space (which we usually indicates by x, y and z) and in the fourth dimension of time (t). Let's see this more precisely (Fig. 23).

Zero dimension corresponds to a point, which itself has no dimension, no size and which is not even in space or time. This is a completely theoretical point, it is, in fact, just information, just like onton, which we will soon see.

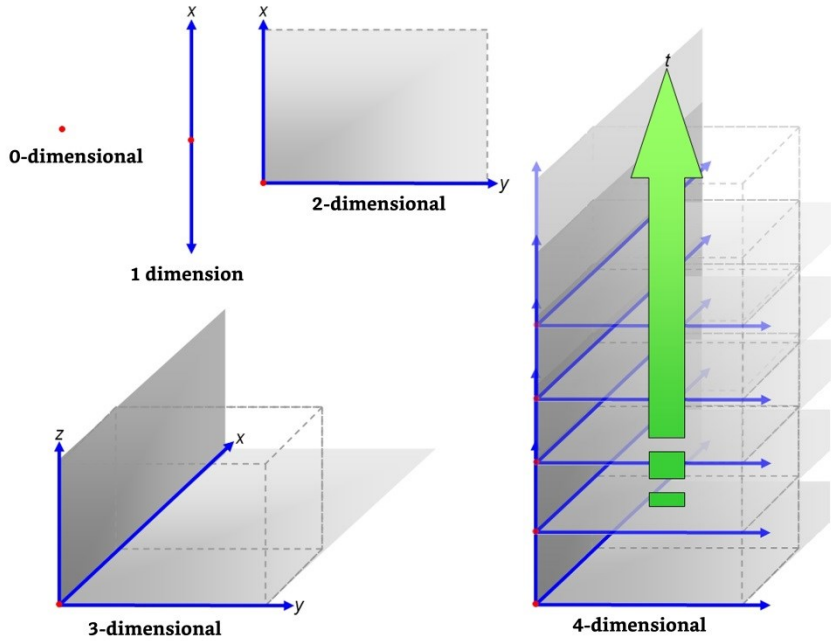

Figure 23: As dimensions are added in space, and then over time, the information that makes up the universe becomes more and more complex.

When we pass to one dimension, it is what corresponds to the extension of the point, forming a line, the dimension *x*. But, there again, this line, if it really has a length, it has no thickness, since it is the multiplication of a point without size. It is new information, just a bit more complex than zero-dimensional.

Now, if we go to two dimensions, the line gets thicker in the sense that it multiplies on the *y* axis to produce an area. We begin to have an object with a small reality, like a sheet of paper, but so thin (it has no thickness, since its thickness is that of a point), that it is invisible. In any case, this is still more complex information than the point or the line.

When we go to three dimensions, the surface gets thicker by developing along the *z* axis. It is from this third dimension that things take on a little more reality, because they acquire

thickness, volume. A point might be a marble, a line might be a plastic ruler, and a surface might be a sheet of paper. We can have objects of different dimensions and a space in which they are located relative to each other and in which they move, animated by a movement, itself along the combined *x*, *y* and *z* axes. However, all this does not yet exist, as something really concrete, because all these points, these surfaces, these volumes have no duration. They do not even have time to appear (nor to move), because time does not exist, not yet. We still only have information, *x*, *y* and *z* data.

In order for the existing to finally appear, for it to be actualized from information into something that exists, like a universe, the fourth dimension is needed: time, *t*. At that moment (it is indeed the case to say it), things having a duration, from moment to moment, they can continue their existence, following the arrow of time. It is space-time as defined by Einstein's theory of relativity. It is in this four-dimensional space-time that we live on a daily basis. But we must not forget that, despite the concreteness and realism of our universe, *x*, *y*, *z*… and *t* are also information!

Now, what about this famous "Hilbert space?" The name of this space comes from its inventor, David Hilbert, one of the greatest mathematicians of the 20th century. It is a multidimensional space, being able to contain an infinity of dimensions, which form as many sub-spaces, themselves multidimensional.

To understand the relationship between our universe and the underlying Hilbert space, we will see Fig. 24. We can represent the Hilbert space as a long infinite cylinder. Orthogonally to this space circulates a hypersurface of the holographic type. This means that this hypersurface, while having only two infinite dimensions, contains the information necessary to make emerge a universe with three spatial dimensions. In fact, when we say "hypersurface," we are talking about a slice, a thin layer, of Hilbert space.

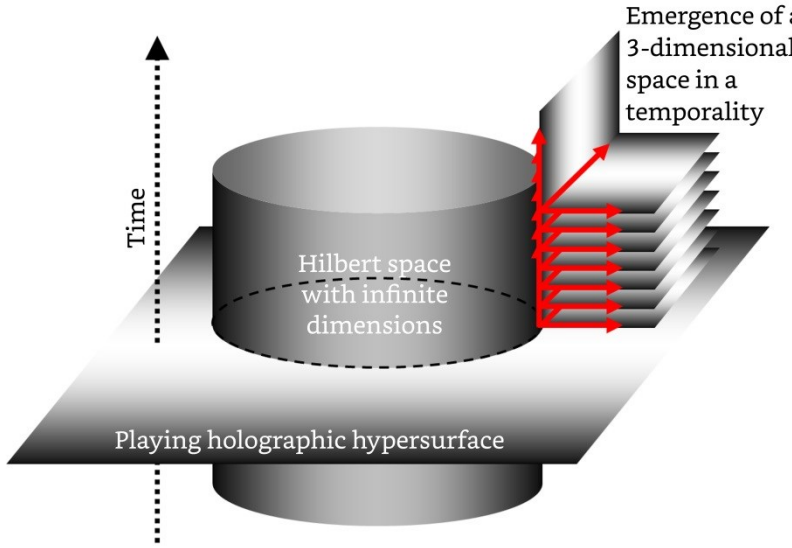

Figure 24: Hilbert space is information, about the structure of being, about the interactions of being with itself. It is traversed by a holographic hypersurface which is perpendicular to it and which produces a three-dimensional space in a temporality.

As the Hilbert space is multidimensional, it is easy to understand that a simple slice of this space contains much more information than an ordinary surface. It is like stepping into a little garden shed and once inside you find yourself in a cathedral or an Olympic stadium. Here, a slice of Hilbert space gives an instant of infinite three-dimensional universe.

Only a moment. Because this slice, this hypersurface travels through Hilbert space and orthogonally to this space. And it is this translation that makes it possible to add temporality to the three-dimensional space of our universe in order, finally, to end up with a four-dimensional space-time.

Of course, if this Hilbert space is, in the first place, a mathematical formalism which accounts for quantum phenomena, it has no other reality than informational. While

speaking of Hilbert space, we are not talking at all about matter, energy, force field, or even wave or particle. Hilbert space is information, about the structure of being, about the interactions of being with itself, and physicists-mathematicians have been able to discover that this information can be described very efficiently as vectors in this multidimensional Hilbert space.

We do not know, ultimately, what waves or particles are, but we do know what operations can be performed on the vectors that represent them, in order to account for their behavior as phenomena: this is the quantum mechanics and its Hilbert space. How can we represent this multidimensional Hilbert space, with an infinite number of dimensions? You have just seen that, already, to represent four dimensions, with a hypersurface, it is necessary to have a little imagination. Effects found in some sci-fi movies can help you visualize what multiple dimensions can be like. Like: you open the door of a small room and you find yourself on another planet, in the middle of the desert, the sky is purple and two suns shine there. In a short story by Robert Heinlein[61],8 someone builds a hypercubic house or "tesseract," the four-dimensional analogue of the three-dimensional cube. By visiting this house, each door or window opens onto different universes, in other dimensions[62].9

But as a hypercube is far from being able to account for the infinity of dimensions of a Hilbert space, let us turn to a beautiful metaphor, provided by David Hilbert himself, during his conferences: the "Hilbert's Hotel.[63]"

Imagine a hotel with an infinite number of rooms, all occupied, because it is a very popular hotel: just think, each room has a window with a view of infinity! Numbered rooms, therefore, 1, 2, 3… infinity! Each time a new guest arrives, the hotelier can easily accommodate him because he uses his hyperintercom to ask each guest to kindly move one

room: the guest in room 1 goes to 2, the one in room 2 goes to 3 and so on… ad infinitum. In the meantime, room 1 is free to receive the new client.

Now imagine that a bus of infinite length unloads in the infinite hall of the hotel an infinity of customers. No problem for the hotelier, he again uses his hyperintercom to ask each guest to please move as follows: the guest of room 1 goes to 2, that of 2 to 4, that of 3 to the 6, that of the 4 in the 8 and so on… to infinity. In fact, the very simple rule that customers must follow is to go to the room whose number is twice the number of the room they are in. The result is that all the rooms with an odd number (1, 3, 5, 7… infinity) are free, i.e. an infinity of rooms to accommodate the infinity of new customers.

Now imagine that an infinity of infinite buses arrive at the infinite parking lot of the hotel and land in the (fortunately) infinite lobby of the hotel an infinity of infinities of new customers. Our hotelier does not dismantle himself, however, because he will be able to use his secret rooms, in an infinite number, it goes without saying. Because between bedroom 1 and bedroom 2, there is a corridor (which surely leads to another dimension!) leading to bedrooms 0.1, 0.2, 0.3 and so on… ad infinitum. The same between bedrooms 2 and 3, between bedrooms 3 and 4 and so on… ad infinitum.

Imagine again that the next day, an infinity of hyperbuses arrive. A hyperbus is a tessaract bus, but with an infinity of dimensions, so that between two places there is always another and so on… ad infinitum. Our hotelier still finds the solution by opening his other secret rooms. Those located in the corridor between rooms 0.1 and 0.2 and so on, etc. For example, rooms 0.01, 0.02, 0.03 and so on. But in front of the infinite influx of travelers, wanting at all costs to accommodate everyone, he still opens the infinity of rooms between 0.01 and 0.02, between 0.02 and 0.03 and so on, etc. (Fig. 25). AND SO ON!

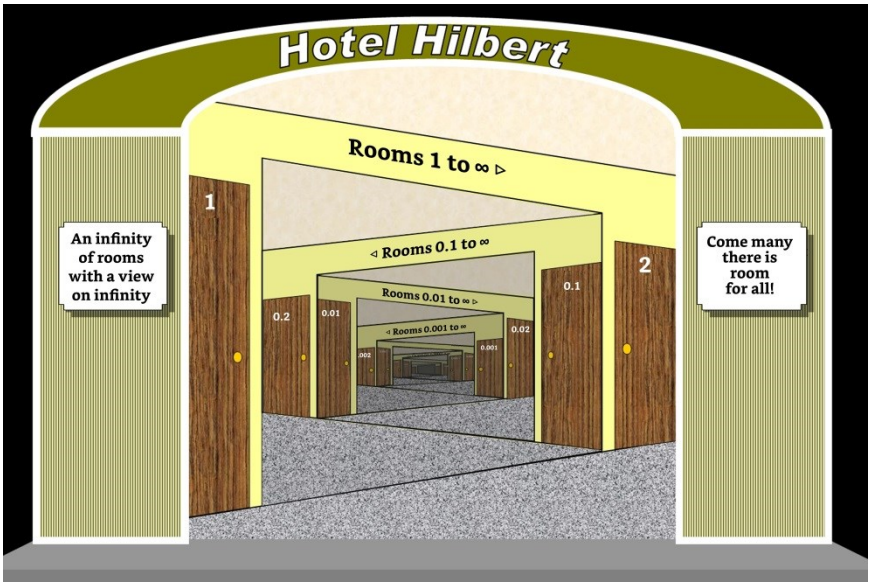

Figure 25: The Hotel Hilbert is made up of an infinity of corridors of infinite length, in spaces perpendicular to each other, each corridor opening onto an infinity of rooms.

Of course, from an architectural point of view, building the Hotel Hilbert is like building the tessaract house: each wing of the hotel is in a different dimension and orthogonal (perpendicular) to the other wings-dimensions of the hotel. Following the illustration, the first corridor (rooms 1 to infinity) extends to the right; the second corridor (rooms from 0.1 to infinity) extends to the left; the third (rooms from 0.01 to infinity) extends to the right; the fourth (chambers from 0.001 to infinity) extends to the left; and so on... These infinite dimensions, of the Hotel Hilbert, are as many sub-spaces that open up in the hotel.

Now that the idea of "vectors in a Hilbert space" is a little clearer and that a "Hilbert space" appears in a more concrete way, we can resume these enigmatic quantum phenomena which are: the entanglement of two particles, the probability of the presence of a photon, the superposition of quantum states of a particle, the double particle-wave nature of

quantum reality. The De Broglie-Bohm's model sheds light on these enigmas with reference to an "implicit order".

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However, this information presents a remarkable structure, since it is multidimensional, an infinity of dimensions which correspond to an infinity of subspaces in Hilbert space. For Hugh Everett, this idea of subspaces is very important, because it is what will explain quantum phenomena. **These sub-spaces correspond to as many universes.** In other words, each wing of the Hotel Hilbert corresponds to a universe and there is an infinity of universes, enclosed in each other, or side by side, in this fractal[64] type structure that represents the Hilbert space.

It was Everett who first theorized, within the framework of quantum mechanics, the concept of the multiverse, of multiple worlds. He was supported in this process by David Deutsch, John Wheeler, Bryce DeWitt[65]. Everett puts the observer and his observation and measurement instruments back at the center of the quantum problem. In fact, the set of states of a particle or a system, or even the set of positions of a particle or the set of probabilities of existence of a particle is distributed in different universes. The observer, meanwhile, only detects, measures, and therefore only perceives and conceives one of these universes at a time. This

interpretation of quantum phenomena thus provides an elegant response to the paradoxes that the results of experiments in quantum physics entail.

Thus, when during an experiment, the measuring instruments are likely to give several different results, before the measurement, all these results, which correspond to as many states of the system, coexist in as many different universes, in the "multiverse" that all of these universes constitute. Once the measurement is taken (and the human being, the research physicist, becomes aware of it), it is as if one of these universes had been selected.

The measuring instrument and the observer find themselves entangled with this universe. And what are interpreted as "paradoxes of quantum mechanics," are in fact only an illusion, because our consciousness cannot perceive several universes at the same time, that it cannot perceive the set of superimposed states.

What is new in Everett's theory is the importance given to the observer and, to use the metaphor of the Hotel Hilbert, the hotel is totally "neutral," in the sense that it does not favor any "wing" compared to others. This hotel comprises an infinity of sub-spaces (of universes) and all these sub-spaces are possibilities. Each hotel client goes to their room, and in doing so, the client is aware of only one wing of the hotel, one subset, one universe. When the client is at the reception and he asks for a room, everything is possible, all options are open, the hotelier can give him a room in any sub-space of the hotel. The client is like the physicist before the photon has passed through one or the other slit, before the photon has been reflected by the mirror or has passed through this semi-reflecting mirror. But, from the moment the client has taken his key, has gone down the hall, into the sub-space, all the other sub-spaces disappear for him. He is like the physicist who took the measurement, who detected

the photon, all the other states or positions of the photon have disappeared.

Let's go back to the EPR experiment: a crystal excited by a laser beam emits two photons (*A* and *B*) entangled in opposite directions. These photons can be detected in any direction in space. Each photon, before its detection, being a wave, they should therefore be able to be detected in any direction independently of each other. However, they are always detected in directions opposite to each other, because of their entanglement: they form a single system. And, if photon *A* is detected well before photon *B*, it is as if photon *B* "knew" that *A* was detected in such a direction, because finally *B* will be detected in the opposite direction, even if *A* and *B* are separated by light years.

Until now, we contented ourselves with explaining the phenomenon of entanglement by saying that photons *A* and *B* form one and the same system, they are not really separated, despite the distance. A rather poor explanation, which does not explain much.

According to Everett's model, when the photons are emitted, the universe will divide into a multitude of choices as to their directions, while respecting symmetry: opposite directions. It is as if the universe split into a multitude of parallel universes, in each of which the photons have different directions. Then, when one of the photons is detected, it is one of these multiple parallel universes which is "selected," a universe in which the trajectory of the other photon is already determined, as opposed to that of the photon detected in first. So there is not a mysterious two-photon "system" or an equally mysterious "message" that would pass instantaneously (faster than light) from one photon to another. Simply, in all the parallel universes, the photons have opposite directions and, whether we "choose" (at moment of detection) any of these universes, so it will be.

In the light of the metaphor of the Hotel Hilbert, one could describe things like this. In each room there is a small decorative gadget on the bedside table: an atom that emits two photons in opposite directions, in any direction, but no room has the same direction. If a traveler arrives in the hotel, he will be assigned a room and he will only see the two opposite directions of the two photons specific to this room. All other directions will be inaccessible to him.

The metaphor allows us to understand that to speak of the universe which "splits," "divides," is just a way of speaking. This is not what is happening strictly speaking. In fact, in Hilbert space, all the versions are "already there," in a way. We are dealing with a **block multiverse**, in which all infinite versions are present, "already written." Then, it is the encounter with an observer (via his detection and measurement instruments, via his sensory organs, his brain, his consciousness) that will produce this "selection" of a universe, among an infinity of others. But, once again, this "encounter" between a consciousness and a universe should not be seen as the miracle of consciousness. For Everett, consciousness is a totally physical phenomenon. For the Mādhyamaka consciousness is a phenomenon in interdependence with other phenomena, but also an illusion, because its analysis brings us back to emptiness. Also, it is simply a consciousness-universe conjunction: this conjunction is "already written" in the multiverse.

Quantum theories

Quantum mechanics, as you will have understood, is used to describe and explain what happens at the microscopic level of elementary particles: photons, quarks, neutrons, protons, electrons, etc. This quantum world is described as particles-waves, "objects" which, depending on how we observe them, measure them, present themselves with more or less particule and wave-like properties. However, if quantum mechanics explains extremely well and with great precision

the phenomena of the extremely small, it is not capable of explaining the phenomena of the infinitely large, where gravitational forces act. For this, another theory was needed.

This is general relativity, which is used to describe and explain what is happening at the cosmological level, the gravitational interaction between large cosmic "objects" such as clusters of galaxies, galaxies, stars, planets , etc. However, here again, if general relativity explains very well and with just as much precision the phenomena of the extremely large, it is impossible for it to explain the phenomena of the infinitely small, the fundamental interactions of matter-energy, what quantum mechanics does.

Both theories have won serious victories, and have never been found wanting, each in its own way, to predict experimental results and observations. Quantum mechanics and general relativity, it works! But, unfortunately, each in its field and both are so different that trying to merge them, to draw from them a single and universal theory which would take into account both the infinitely small and the infinitely large leads to inconsistencies, impossibilities. There is a fundamental incompatibility between these two theories, these two visions of the universe.

If a number of physicists confine themselves to the pragmatic attitude consisting in using one or the other, according to the needs, without asking any further questions (this is what the supporters of the Copenhagen model do), many others physicists seek to unify these two theories that everything opposes. They are looking for a "theory of everything," capable of explaining both gravitational interactions and the interactions of fundamental particles. This is all the more so as certain extreme phenomena, such as the Big Bang, black holes, require the use of both theories at the same time.

Among these attempts at unification between quantum mechanics and general relativity (we then speak of "quantum

relativity"), two models are currently emerging in the scientific consensus (and debate), these are the theory of "superstrings" and that of "loop quantum gravity," theories that we will see in more detail, but in a very simplified way. It is simply a question of showing how such theories prefigure the idea of an informational ontonomic matrix.

The superstring theory

In fact, there is not one string theory, but several, notably in what is called "superstring" theories. Many physicists and mathematicians contributed to their formulation, among whom Leonard Susskind is the best known[66]. All these theories have in common to describe the particles and the fundamental forces of the universe, like the vibrations of tiny "strings," all identical. These strings would be a Planck length (10^{-35} meters), without any thickness, they move and could be open or closed. These strings also require designing a universe with more than four dimensions (the three spatial dimensions and time). According to the theories, these dimensions can be five, six, ten, eleven or twenty-six in number… These are looped dimensions, rolled up on themselves, extremely small (of the order of the Planck length) and which are therefore unattainable and imperceptible to us, unlike the four dimensions that we perceive and make up the size of the universe. These dimensions are called "D-branes[67]," the strings open by their ends are fixed.

Thus, the string theories make it possible to explain at the same time the quantum interactions, but also the gravitational interactions by considering a new fundamental particle, the graviton, carrying the force of gravitation, a quantum of gravitation. It is the different modes of vibration of the strings, as well as the rotation of their plane of vibration (the spin), which translate into photons, quarks, neutrons, protons, electrons, etc. (see Fig. 26).

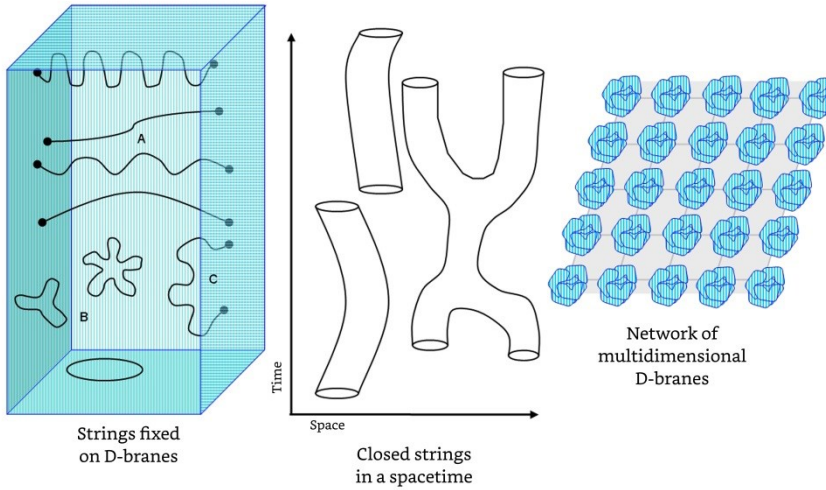

Figure 26: Presentation of different aspects of strings according to string theory.

This very simplified and approximate diagram is just intended to give you a vision of superstring theory, which is of a very great mathematical and conceptual complexity. On the left, there are examples of strings attached to D-branes. We see open strings (*A*), fixed to the D-branes, closed strings plated on the D-branes (*B*), an open string whose two ends are in contact with the same D-brane (*C*). In the center, we see closed strings, in a space-time, this space being able to be of three dimensions or more. On the right, finally, the representation of a network of D-branes. These are D-branes rolled up on themselves, the strings are inside.

However, it should be noted that the superstrings theory, while interesting a very large number of physicists and theoretical physics laboratories around the world, remains a pure theory, in the sense that no experiment could be imagined and still less realized, to demonstrate it.

The loops quantum gravity

Like superstring theory, loop quantum gravity theory is intended to unify quantum mechanics and general

relativity[68]. This theory was developed by Abhay Ashtekar, Lee Smolin, Thomas Thiemann, Carlo Rovelli and Jorge Pullin[69]. A work in mathematics by Abhay Ashtekar first made it possible to quantify gravitational forces, Lee Smolin adapting this quantification to a closed curve in space (a loop). The other researchers gradually developed the theory to arrive at a network of intersecting loops, in a granular (quantized) space-time of the order of the Planck length (10^{-35} meters) and the Planck time (10^{-44} seconds). The difference between the two theories is that, for superstring theory, the strings are in a space-time, while for loop quantum gravity, the loops themselves form the space-time.

In fact, for loops quantum gravity, space-time is like a weave of space, time, and gravitational force quanta. It is the fluctuations of this weave, on the Planck scale, which give the force fields (the waves), the particles and the macroscopic matter as we observe it around us. Gravitational loops are basically closed (hence the name "loop"). Their intersections form the weave of space. And it is their opening in lines that form what appears in this space: waves, particles, matter, energy… As for time, loop quantum gravity eventually eliminates it completely. It is just reduced to a condition of space: where there is space, there is time. Time is therefore dynamic, as in the theory of general relativity (Fig. 27).

In this figure, we have a representation of the granular space. Each closed curve therefore represents a "loop," a quantum of the gravitational field, which is also a quantum of space. The segments that connect the loops symbolize the network that the loops form between them, the network of adjacencies (who is next to whom). It is the values of the gravitational field which determine the variable size of the quanta of space. The space-gravitation loops are therefore like soap bubbles, stuck together, making a foam.

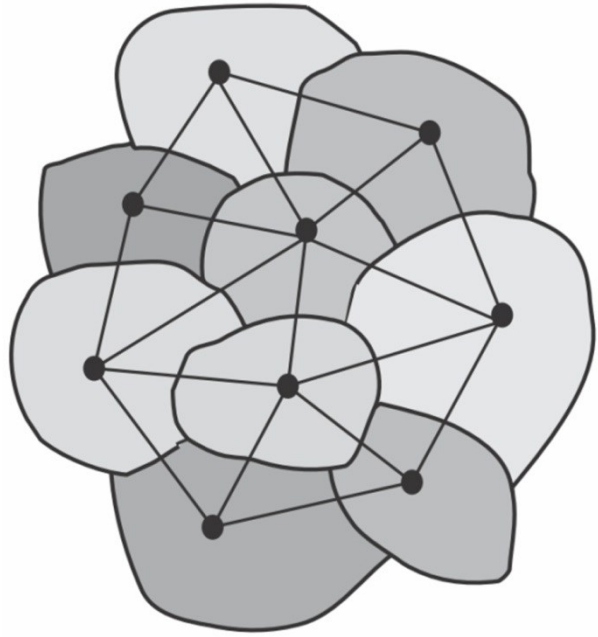

Figure 27: According to loop quantum gravity, space is granular formed of closed loops, of space-gravitation, making a network of adjacencies, like soap bubbles, stuck together, making a foam.

Much like string theory, loop quantum gravity theory is still scientific speculation. Quantum mechanics and general relativity are still not united. The gravitational force, which operates in the infinitely large, is still not united with the three other fundamental forces (weak and strong nuclear interactions and electromagnetic interaction), which operate in the infinitely small. However, these two theories tell us that the fundamental constituents are one-dimensional elementary quantum objects and that the size of their reference space-time is of the order of Planck length and Planck time. Then, that these elementary objects are part of a weave, a network, either which fills the whole space (strings), or which constitutes the whole space (loops), according to the adopted theory. Finally, that these elementary objects

cannot be described only from our four spatio-temporal dimensions, but assuming other dimensions, very small and rolled up on themselves. These theories are, to date, descriptive mathematical tools of what could be at the base, at the foundation of everything and this is very close to information which would then be "translated" into phenomena, matter and energy. They show us, in any case, the path to the informational ontonomic matrix, a matrix that we will be able to present in the next section.

THE INFORMATIONAL MATRIX

Thus, modern science, as we will see, joins, more than 2,500 years later, the most profound Buddhist teachings. What quantum mechanics tells us can be summarized in the following eleven propositions:

1) There is an implicate order, an underlying information in the universe. This primordial information corresponds to a quantum potential, from which the particles-waves are actualized, following a holographic relationship.

2) The primordial information is inscribed in an infinite multidimensional Hilbert space.

3) Each dimension of the Hilbert space is orthogonal to the other dimensions.

4) The dimensions of the Hilbert space form a holographic network.

5) Each dimension of the Hilbert space corresponds to a universe, which together form the multiverse.

6) Primordial information does not have, in its very structure, a spatiality or a temporality, it is outside of time and space.

7) This primordial information concerns the states and the interactions between fundamental components which

themselves derive from this information: the information of the information.

8) It is the "reading" of this information that produces space and time, by means of a "quantification" on the Planck scale, which corresponds to the quantum weave (which is located at the interface between the informational ontonomic matrix and the phenomenal universe).

9) At the base of the phenomenal universe therefore exists a quantum weave, which fills all space, on which are placed elementary quantum objects in one dimension, on the Planck scale, both for space and for the time.

10) This meta-information first actualizes into force fields, of a wave nature, then the interaction of these fields actualizes itself into particles.

11) Reality is, in itself, elusive, neither wave nor particle, but both at the same time, while remaining, in this fundamental duality, an indeterminate, mysterious reality, whose only tangible thing that we can get out is information: the Ultimate Reality is neither force field, nor wave, nor particle, nor matter, nor energy, but information.

Now that this beautiful and vertiginous quantum synthesis is posed, we will be able to examine what the most advanced Buddhist teachings say about it. For this, we will look at the Avatamsaka Sūtra, which describes the Ultimate Reality, the *Dharmadhatu*.

The Supreme Matrix

The title "Avatamsaka Sūtra" can be translated as "Sutra of the Adornments of Splendor." This text was written by the Buddha shortly after he attained enlightenment. Towards the end of this very long text is the "Gandavyāha Sūtra" which describes the Ultimate Reality, the *Dharmadhatu*. This is a very modern vision of the universe (in the sense that it corresponds to what quantum mechanics describes twenty-five centuries later): an "omniverse," beyond time and space,

composed of fundamental interpenetrating elements, as in a fractal.

This Ultimate Reality, the *Dharmadhatu*, is very different from the phenomenal reality. The latter gives us to see an illusory universe, with entities and realities separated from each other, stuck in a spatiality and a temporality. Conversely, the *Dharmadhatu*, this Ultimate Reality, is beyond time and space and relates everything to all things, showing us an intricate multiverse, which is the true reality underlying the phenomena of our daily lives. The technology of universe changing, quantum leaping from one universe to another, parallel universe, stems directly from this understanding of Ultimate Reality.

The *Dharmadhatu* is the block multiverse, the set of all phenomena in the three times, past, present and future. That is to say a matrix out of time, which describes everything and its temporal evolution. Moreover, "Gandavyūha" means in Sanskrit "Supreme Matrix[70]." 17

For the *Dharmadhatu*, all phenomena interpenetrate. One of the images that is used to illustrate this is to consider each phenomenon as a mirror which reflects all other phenomena and which reflects itself in all other phenomena and its reflections in turn reflect in each other in an infinite expansion of reflections. We will come back to it soon in more detail, but this is a pictorial description of a Hilbert space, with the infinity of its nested dimensions.

If it is difficult to understand what is meant by "interpenetration" or "interexistence," "interbeing," with the macroscopic phenomena that are ourselves, our fellow human beings and all the objects in our environment, up to the stars, things are much clearer if we consider the "phenomena" in the sense of the quantum weave, that is to say the ultimate quanta of information, at the Planck scale, as they actualize from the informational ontonomic matrix. In this sense, interpenetration partly corresponds to the

concept of quantum entanglement. Deeper still, interpenetration must also be understood as a way of talking about the multidimensional structure of Hilbert space, which is the basis of the matrix that underlies the multiverse.

No doubt you remember the famous "Hotel Hilbert," a beautiful metaphor invented by the very inventor of Hilbert's space, David Hilbert, one of the greatest mathematicians of the 20th century. Now imagine that more than twenty-five centuries earlier, this same metaphor was created and used to be able to explain the *Dharmadhatu*, the Ultimate Reality. This is the "Vairocana Tower," named after a famous Buddha. Here is its description, following the translation given by a Japanese master.

"The Tower is as vast and spacious as the sky itself. The ground is paved with an infinite number of precious stones, palaces, porticos, windows, stairs, gates and corridors. And in this Tower, spacious and exquisitely adorned, are an infinity of towers, each of which is as exquisitely adorned as the main Tower. And all these towers, impossible to count, do not interfere with each other, each one keeps its particular existence in perfect harmony with all the rest. But nothing also prevents a tower from blending in with the others, individually and collectively. This corresponds to a state of perfect interpenetration, but also of perfect order. Whoever enters this multiple Tower, finds himself simultaneously in each of these towers, which allows him to contemplate the infinite series of phenomena[71]."

Vairocana Tower is outside of all temporality, because it contains all past, present and future phenomena and events "at the same time" (i.e. outside of time). We find well in this beautiful metaphor, just like with that of the Hotel Hilbert, the description of the quantum matrix, of the informational ontonomic matrix. We find there the fractal and holographic characteristic of the matrix: each individual quantum

phenomenon, while remaining itself, is the reflection of all the other quantum phenomena and is reflected in all the other quantum phenomena, it is entanglement, interpenetration.

Indra's Net

In this same Gandavyāha Sūtra, we find another metaphor even more explicit and illustrative, it is about the "Indra's Net." In the mythology of the Vedas, of ancient India, Indra is the God of gods, Lord of Heaven. The metaphor refers to it to give a fundamental, absolute dimension to the idea of the "net." Here is the text.

"Above the cosmic palace of the Supreme God Indra hangs a marvelous net, entirely woven with threads of light and extending endlessly in all directions from space and time. At each knot of this net hangs a diamond with an infinity of facets. The net being infinite, the knots are infinite in number and therefore there are an infinity of diamonds, so that at night the net offers the marvelous spectacle of a starry sky. If we choose one of these diamonds at random in order to examine it more closely, we will discover that on each of its innumerable facets are reflected all the other diamonds of the net, in infinite number. But still, the infinity of the diamonds thus reflected, also reflects the infinity of the other diamonds, in reflections of infinite reflections[72]."

Fig. 28, an artist's impression of Indra's net[73]. Here the diamonds have been replaced by chrome spheres, but the principle, as described, is the same. The description of Indra's Net is even more reminiscent of the matrix, a multidimensional Hilbert space. The "threads of light" remind us that we are at the quantum level (photons being quanta). "In all directions, of space and time" well symbolizes the multidimensional characteristic of this quantum weave, as in the Hotel Hilbert.

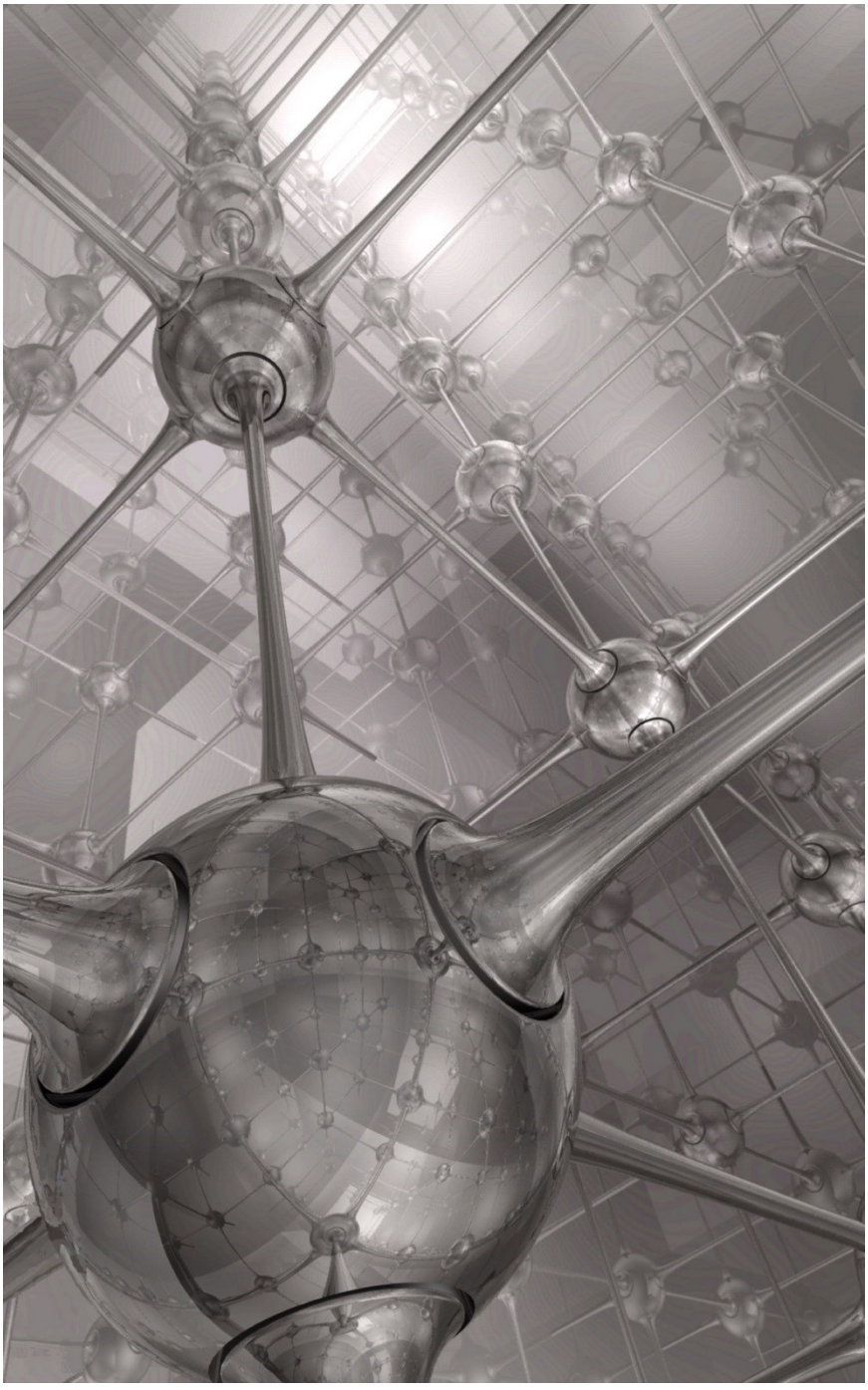

Figure 28: Indra's net, artist view.

Indra's Net is not a flat net, like that of the fisher, but a three-dimensional net, each knot of which opens onto an infinity of other dimensions. Multidimensionality concerns each quantum element ("a diamond with an infinite number of facets"), which contains all the other infinite quantum elements ("on each of its innumerable facets are reflected all the other diamonds"). But these dimensions themselves, in a fractal composition, open onto an infinity of other dimensions, *ad infinitum* ("the infinity of diamonds thus reflected, also reflects the infinity of other diamonds").

Usually the metaphor of Indra's Net is interpreted as an illustration of the concepts of emptiness, interdependence, conditioned co-production. Phenomena are inconsistent and incessantly becoming, for they are composed of sub-phenomena and they compose other more complex phenomena and all of them are ephemeral, appearing, lasting for a time and disappearing. All phenomena dependent on causes are the effects of causes, which condition their birth and then their extinction. This is called emptiness. Thus, phenomena are interdependent with each other.

However, Indra's net metaphor is far too rich to represent only conditioned co-production. It speaks to us above all of interpenetration. And, as far as phenomena are concerned, it tells us much more about quantum objects (photons, strings or quantum loops) than about the macroscopic phenomena that surround us. It is a metaphor that speaks to us of the quantum weave, of the matrix that underlies the multiverse, of this infinitely multidimensional Hilbert space, whose vectors determine the infinity of the universes.

No doubt it is now time to finally approach this quantum weave, this informational ontonomic matrix of which, twenty-five centuries apart, the Vedic and Buddhist metaphysics of the ancient East, and the quantum physics of today, agree to make it the foundation of the Being and the

information that presides over its phenomenal expansion in the multiverse.

The ontonomic model

Any scientific cosmology cannot do without a so-called "ontonomic " approach, insofar as no one can say what happened, nor in what state the universe was in during the very first portion of time, the 5.4×10^{-44} first seconds (Planck time), not even less *before* this first instant. Likewise, the science currently fails to understand what may well exist, and in what form, in a spatial dimension or in a movement less than 1.62×10^{-35} meters (Planck length). The informational ontonomic model of the universe therefore proposes to start from an ontonomic reflection, on the basis of an informational model, in order to renew our vision of the universe. It should be noted that the scientific and metaphysical ontonomic approach will try to respect Mach's principle of economy in science, that is to say, to formulate an informational ontonomic model that is as simple as possible, with the fewest possible hypotheses. We will appeal both to the Buddhist contributions (the Mādhyamaka, the Brahmājālasūtta, the Prajñāpāramitā, the Avatamsaka Sūtra and the Gandavyūha Sūtra) concerning the conception of Ultimate Reality (the *Dharmadhatu*, the Supreme Matrix) and to the modern contributions of quantum mechanics (the Hilbert space and the quantum matrix).

Our point of departure is the fundamental metaphysical question, that of Leibniz[74], of "why is there something rather than nothing?" Of course, since we are no longer going to do, at this stage, metaphysics or approach things from the ontological angle, but ontonomic al, this question is a simple starting convention and we do not claim that it is legitimate or relevant, to ask it. We are also not going to put forward the idea that there would be an answer to this question nor are we going to try to answer this question (which would send us

back to a teleological dimension, resembling religion, which is not in our approach to the problem of the universe).

The Leibnizian question is mentioned here simply to usefully recall the framework of metaphysical thought, that is to say the original and conceptual duality between absolute being and absolute nothingness. This original duality, this basic dichotomy, is important to pose from the start, in order to fully understand what the informational emergence of being represents. To carry out our reflection, we are going to use a practically topological image of information, which should not be mistaken. All the diagrams, the lines, the curves, the points, which we will use do not represent in any way the universe energy-matter such as we experience it on a daily basis. All our representations are symbolic, like mathematical representations which represent, for example, quantities, forces, vectors, etc.

Our formalism is intended to represent information and its transformation. Another important element to underline is that, initially, we will not speak at all of energy, matter, forces, particles, fields, etc., of all these data which belong to the phenomenal universe. The starting point of the informational ontonomic model of the universe concerns information, that is to say ultimately, the very being of the universe, hence the legitimate epithet "onto–nomic" (the informational laws to which the being obeys).

In the same way, this "cosmological" study necessarily unfolds according to a succession of concepts, according to an organization of thought, with a beginning, an unfolding and a conclusion of ideas. This unfolding, this succession, are dependent on the linear functioning of our thought, our discourse and our writing. We must not therefore be mistaken and consider these stages of reflection as the stages of the "creation of the universe." Informational ontonomic thinking is even before any conception of time and space (as well as matter and energy), so when we set a starting point

for our thinking, it does not in any way mean that we set a starting point, even a theoretical one, for the universe. The informational universe has neither a starting point nor an ending point, it has no history.

There is what can be called a "fundamental ontonomic error" (FOE), which must be identified from the outset of an ontonomic reflection, so as not to shift metaphysical ontonomy of a strictly informational model to a model of classic, phenomenal physics.

This error consists in: granting phenomenal properties (spatiality, duration, form, energy, etc.) to the onton and its informational expansion.

The onton, as information, has neither spatiality, nor duration, nor form, nor energy, etc., since it is the informational expansion of the onton as an informational matrix and the "reading" of this matrix, slice by slice, which will produce spatiality, temporality, form, energy, movement, etc., that is to say the phenomenal universe.

First step of ontonomic expansion: the onton

The principle of economy that we are going to follow throughout the presentation of this cosmological model commands us from the outset to drop the phenomena. Ancient philosophers often started from phenomena as they present themselves in all their complexity. Some, starting with the Greek Democritus (4th century), began to consider the notion of atom as an indivisible, elementary, always identical to itself, unit of matter, whose various combinations could explain the complexity of phenomena. But the powder of matter is still much too complex to be able to respond to the principle of economy. Modern knowledge about fundamental particles and quanta suggests that we can go even further in conceptual economics. The large family of 38 fundamental particles, all of the fermions and bosons[75], also suggests that we are still in the field of the phenomenon

and that there is a fundamental even more fundamental. It is here that we need, just for a moment, the inspiration of metaphysics, simply to help us start from a truly fundamental point, since it conditions all the rest: the absolute Being.

Therefore, the starting point is that of absolute being. We consider absolute being according to its classical metaphysical conception, that is to say "being as being," without any reference to its phenomenal forms. Absolute being is primary information, which is opposed to absolute nothingness. Absolute nothingness, the "nothing at all" (the *Śūnyatiśūnya* of Mādhyamika Buddhism), is, like the Leibnizian question, a convention of representation. We can describe this absolute nothingness as a pure "nothing," which excludes both everything that exists and any subject that can account for this absolute nothingness. In other words, the concept of absolute nothingness refers to the very absence of conceptualization (there is so nothing that there is even no one to account for this nothing).

From there, according to the (weak) anthropic principle, since we are indeed here, me thinking and writing, you reading me and thinking, and that we all share the intersubjectivity of the experience of this universe, we agree that something exists: there is a being, in the sense that there is an existent. In reference to experience, this being is in a first phenomenal approach, which we will leave aside for the moment (the phenomenal analysis will be for later). This is why we are going to be interested in absolute being, outside of all categories or phenomenal qualities, as a symbolic representation of the existent opposed to nothingness. From the outset, the reader is invited to clearly distinguish between these two levels of analysis: the *ontonomic level*, which concerns the question of absolute being approached from both an informational and quantum angle, and the *phenomenal level* which will deal more far, starting from the ontonomic base, from the expansion, no longer

informational, but phenomenal – matter and energy inscribed in a temporality – of the existing as a universe.

This absolute being we are going to symbolize and name it in order to make a concept of it, this with the aim of studying this absolute being according to informational ontonomy. This absolute being is symbolized by the number 1 placed between small brackets, thus: {1}. We will call it "onton." The term onton is coined (just like "ontonomy" and like "ontology") from the Greek root *ôn*, *ontos*, which means "being." Onton refers to absolute being as a *unity of being*. In other words, being is not this or that, in the phenomenal field that we experience, it is not this table, this tree, this color, this world; we apprehend being here, as a unit of being, as an *atom of being*, more precisely a *quantum of being*, an existential unity {1} which, by its own unfolding, composes the complex phenomenal being of which we experience it daily.

As, for the moment, theoretical, we also introduce here the opposite concept of "nihil," symbolized by {0}[76], which represents a kind of unity of absolute nothing, knowing that this unity of absolute nothing is in itself a contradiction, since absolute nothingness implies no longer conceiving or representing anything. This nihil is to be considered a bit like the idea and the symbol of infinity (∞) in mathematics, it suggests in any case, with regard to the onton {1}, a binary dimension of absolute being[77], as an expansion of {1} and {0}, of ontons of nihils[78]. The formula below symbolically represents this first expansion of being.

First expansion of being: onton and nihil.

{1}{0}

If we consider the Leibnizian starting point of absolute nothingness, the first expansion of absolute being, which comes to justify *a posteriori* the phenomenal existent as "something instead of a nothing," presents itself as a "point of existence," a primordial information. From there, our

analysis will focus on the "becoming" of this onton, in the sense that we need to be able to explain how this primordial onton, this quantum of being, can unfold into a phenomenal being such as we make it into experience permanently and which constitutes the whole of the universe, with its matter, its energy, its forces, its fields, all in a three-dimensional space and a temporality. From its primordial "coming" to the phenomenal world, the onton unfolds in five stages. We have just seen the first, we will move on to the following ones.

Second step of ontonomic expansion: the string

There is indeed a sort of conceptual chasm between this onton and the phenomenal universe, in all its complexity, its extent and its duration, the systems, the forces, the movements, in two words the events and phenomena which occupy it. We must therefore consider a kind of "unfolding" of the onton, in order to fill this conceptual gap. This expansion is possible, justified, from the observation of the phenomenal universe as we constantly experience it. And the conceptual gap between onton and universe means that the onton contains the phenomenal universe in a potential way. The universe is already there, potentially contained inside the onton. Likewise, it follows that each stage of the expansion is potentially included in the preceding steps of the expansion[79].

The second step in the unfolding of being as absolute unity can be represented as a repetition, a succession. Here, the error would be to stick to the trivial image of temporal succession, a series in time. Let's not forget, once again, that we are not at the step of dealing with time (nor space, for that matter) and that when we say that the onton succeeds itself, doubles, triples, quadruples, etc., you simply have to see the succession of symbols about information. For example a succession of capsulated 1: {1}{1}{1}{1}{1}{1}, which can also be written {111111}.

We are therefore not talking about a multiplicity of ontons, but of one and the same onton which unfolds over a given number of levels. What we call "level" represents a sort of generation of the onton from itself, reproducing itself identically. This reproduction should not be seen as a true multiplication. The informational ontonomic model follows the principle of economy well and there is currently no reason to design more than one onton. Simply, this onton, in order to be able to come about phenomenally, forms a line, an ontonomic [80] "string[81]," which represents a succession of ontonomic levels of the same onton[82]. It is for this reason that when speaking of the onton, it is undoubtedly preferable to say "expansion" rather than "repetition" or "succession", terms that refer to a temporality.

We clearly repeat it here, we are not within the framework of any temporal representation, but at the informational level, a bit like the bits engraved on a DVD (notwithstanding that these bits follow one another on a material and spatial support, the disk , which is not the case of ontons which are located *before* any conception or reality of space and time). The ontonomic levels are repeated, we can say that, because we are talking about information here, it is the information represented by the onton which is repeated.

A clarification concerning the concept of information. This concept is understood here in an absolute ontonomic perspective, which means that the concept does not correspond exactly to that of phenomenal information usually considered, for example, in the information theory of a Shannon[83] and Weaver[84]. Thus, ontonomic information is located before the notions of entropy and negentropy. The onton does not fight against a disorder, it only differentiates itself from the nihil. Ontonomic information therefore has nothing to do with thermodynamics or with questions of probability/improbability.

However, just like Shannonian information, ontonomic information can be quantified, it is the informational expansion of ontonomic levels from the unique ontonomic. Already, in classical information theory, information should not be confused with its material support (information is not alphabetic and numeric characters printed in the newspaper, the bits engraved on the DVD or the sound waves of the tom-tom). Information is an event or a succession of events (each printed character of the newspaper is a perceptual event for the reader and it is the appearance and the succession of characters which form the information, it is the same for the DVD or the tom-tom). As far as ontonomic information is concerned, it is worse! This information is located even *before* any material support. In itself, it is without support, since it is itself at the origin of all support. To conceive ontonomic information consists in carrying out an intellectual gymnastics which will abstract the ontons and the nihils from any support and from any other thing. In Fig. 29, two types of onton expansion are represented: mass and stochastic expansion and linear expansion (string).

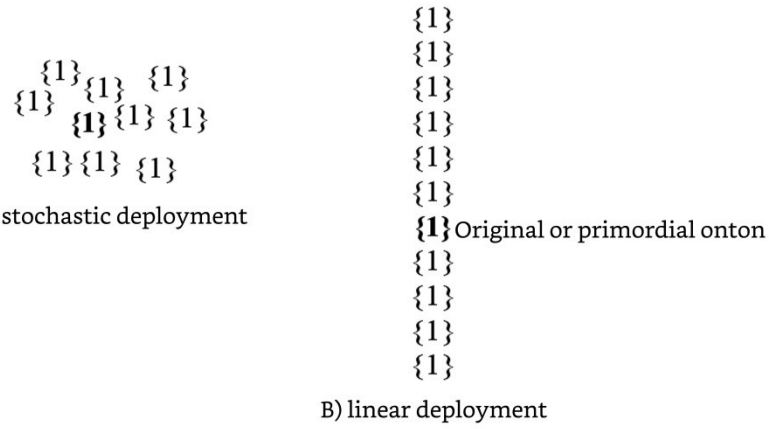

Figure 29: Stochastic or linear deployment of the onton? The FOE of a material design of the onton should be avoided. Its unfolding is linear and purely informational, within the framework of the informational matrix. In bold, the original or primordial onton has been represented.

Regarding the second expansion, why not design a random expansion (*a*, in the figure), in all directions, instead of a linear expansion? This would be to succumb to a new FOE assuming a spatialized expansion of the onton. In fact, the expansion will be represented in a linear way (*b*, in the figure) so as to avoid the FOE which would consist in spatializing the second expansion ("in all directions"). The second expansion (like all the other expansions, from the first) is not at all spatial, but informational. The expansion is not "linear," but it is its representation which takes a linear form (the primordial string). By this line, we extend in a way the conceptual stripping of the onton, as an absolute being, without any phenomenal quality, which multiplies under the representation of a line (presented vertically by convention). Between onton and string, there is a relation of potentiation: the onton potentially contains the string.

Another reason that leads to an informational representation in the form of a string is that by constructing the concept of an informational matrix, we are indeed talking about a Hilbert space. Now, we have seen that the dimensions of such a space are orthogonal. This means that the information is, itself, orthogonal. The line is orthogonal to the point. The original onton therefore unfolds orthogonally to itself, which corresponds well to a linear string (line).

Third step of ontonomic expansion: the loops

Each step of ontonomic unfolding is a necessity that stems from the principle of unfolding, that is a form of expansion of the information. Indeed, if we had remained at absolute nothingness, we would be in a Leibnizian contradiction because, in our experience, there is not nothing, but something. From this flows this basic, fundamental information, this quantum of being, the onton, as a unique point of existence, but containing the potential of all that exists.

Then, if we had remained at the level of the onton, again, from the non-universe we only pass to a potential universe, which is in contradiction with the actualized universe which we experience. Subsequent deployments of the onton are therefore a necessity to bridge the chasm of actualization between the primordial onton and the phenomenal universe. Hence the multiplication of the onton, as represented by the string.

Now, if you do not want to get stuck at the level of the string, a single string, and in order to sail ever further towards phenomena, we must go further than the string and, like the onton which potentially contains the string, the string potentially contains a multiplication of itself, that is to say strings. At the level of informational "symbolism," this multiplication of strings must take into account the need for continuity from the original onton, then the primordial string and the strings. As in this children's game for which one must follow a path without lifting the pen from the sheet, one must be able to follow the unfolding of the onton without any informational break.

In other words, as we have to pursue the onton expansion model, we will have to consider several strings. However, insofar as the principle of economy commands us to consider only one onton, all the strings can only represent the expansion of this one and only onton. In Fig. 30 we will see how this happens.

The line of ontons (*A*, in the figure) represents the linear unfolding of the primordial onton into a primordial string. This expansion is a multiplication of this original onton on either side of itself. This expansion is, *a priori*, without limits, because one does not see from the start what could limit it, insofar as, to join the infinite appearance of the phenomenal universe, the onton must itself multiply in an infinite way. This infinity is symbolized by the capsules {∞}, at each end of the string.

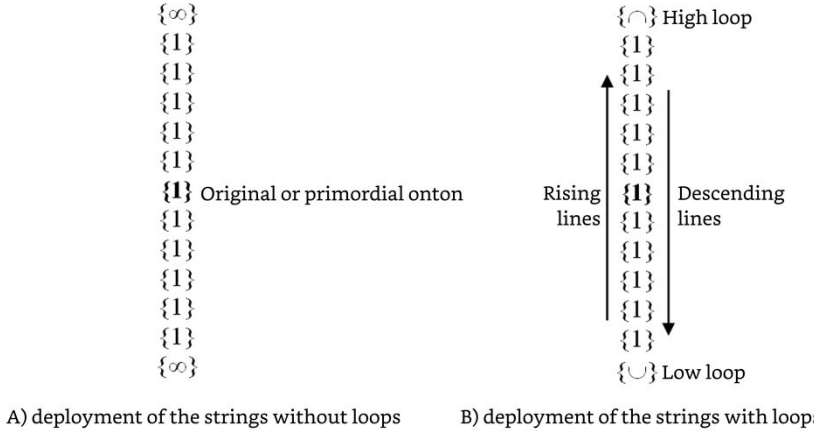

Figure 30: To go beyond a deployment limited to a single infinite string (*A*), the onton deploys in the form of merged rising and descending strings, with high and low loops (*B*).

In order not to remain with this unique infinite string, just as the unique onton potentially contains all the other ontons, the unique string potentially contains all the other strings. Here, we must introduce the concept of informational fusion: an onton or a string can contain other merged ontons or strings, up to an infinity. The fused ontons or strings therefore have a potential existence.

If we consider that the fused strings extend to infinity at both ends (*A*, in the figure), then these strings are like a bundle of sticks from a pick-up sticks game (fused sticks, however). So there is an information gap at both ends, because you can never follow the informational path from one string to the other, strings being infinite.

Also, to be able to consider the multiplicity of cords, while respecting the principle of the continuity of the unfolding of the onton, one must imagine the onton realizing a sort of half-turn, a "loop," during its linear expansion, as a string, which is symbolized (*B*, in the figure), by {∩} (the high loop) and {∪} (the low loop). A "rising line" goes towards the high loop and a "descending line" descends from the high loop and

the reverse for the low loop[85]. The onton thus performs a very large number of round trips, with rising and descending strings, which make high and low loops.

Of course, it is never a matter of looping which would enclose the onton in a closed circuit. The onton always remains open to the infinite highs and lows. In the figure it is therefore necessary to imagine, at least a capital N, whose three lines are merged: the half-line on the left having an infinite length downwards and the half-line on the right having an infinite length upwards, the middle segment having a finite length, between the two loops, high and low.

More specifically, what is a loop? In a first approach and always remaining in the simplest possible conceptualization, we can say that a loop is a change of direction of the onton in its expansion as a string: from rising to descending and from descending to rising. Here are some examples of loops in Fig. 31.

By convention, we used in the capsule small arrows in exponent to symbolize the "direction" of a string's expansion: rising ($\{1^{\uparrow}\}$), descending ($\{1^{\downarrow}\}$), fused strings, one of which rises and the other descends ($\{1^{\updownarrow}\}$).

In *A*, the two strings being merged (double arrow in exponent), the loop appears as the fusion of the two end ontons (the last of the rising string and the first of the descending string). In *B*, with two joined defused strings (see the next section for more details on defusion), the two end ontons are simply joined and the information spreads from one to the other. In *C* and *D*, there is separation of the strings, so there are one or more intermediate ontons between the end ontons.

These ontons therefore continue the path of the string "horizontally" and orthogonally, as it should be, to the axis of the strings. Its linking ontons can be seen as strings of a single onton. This is what the loop modalities are, knowing that they are similar and inverted for the low loops and that

the separation between two strings can be more or less important, between an onton and an infinity of ontons.

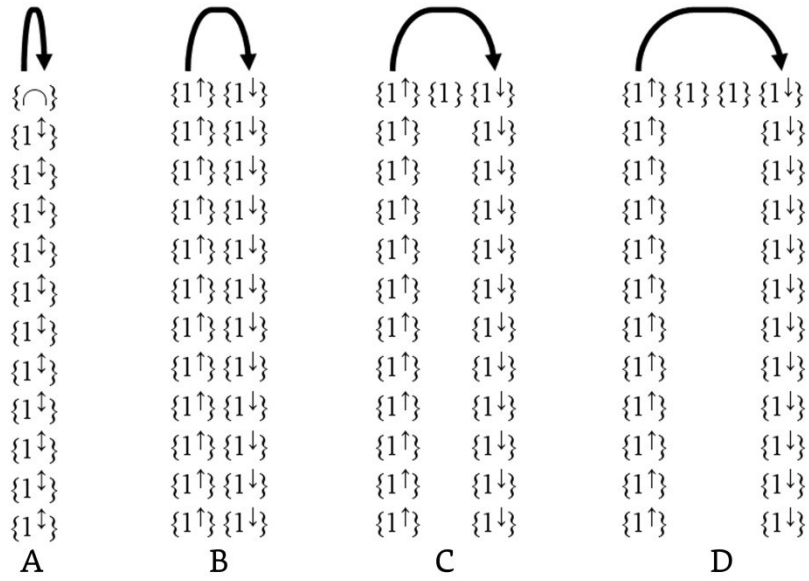

Figure 31: The low or high loops can take various modalities (*A*, *B*, *C*, *D*) with the ends ontons merged (*A* and *B*) or "horizontally" and "orthogonally" deployed (*C* and *D*). The modalities are identical for the low loops not shown in the figure.

Fourth step of the ontonomic expansion: the string defusion

The concept of "defusion" is not new to us, because without naming it explicitly, we saw a first defusion when, from the primordial onton, the primordial string emerged, upwards and downwards. Defusion then actualized a potential, that of the string from the onton. Then, we have just spoken of defusion with regard to the loops for which two strings do not remain fused, but detach from each other, to remain contiguous or to take distance. Let's take a closer look at this idea of defusion.

Indeed, until now, as far as the strings are concerned, the principle of economy always dictates the strict fusion of the

strings. Nothing "forces" the strings to be different from each other. Indeed, throughout our construction, we have applied this principle of economy, this principle of reluctance, which consists in letting oneself always be attracted by the simplest and in departing from this simplest only by the unavoidable need to allow the onton to unfold, ultimately to arrive at justifying the phenomenal existence, the one we constantly experience. For this, we started from the simplest: the onton, as a single point of information representing absolute being (as opposed to absolute nothingness). Subsequently, the conceptual tension between the simple and the complex to conceive a type of "succession" from the onton to itself (and what could be simpler than the repetition of the simplest), in the form of a string representing "levels" of existence, one could say, of the onton. Now, the appeal of the phenomenon pushes us to go further, but the reluctance attached to the principle of economy pulls us in the other direction. The result of these two conceptual forces is the idea of fusion and defusion.

In order to continue its unfolding, the onton has unfolded into strings (thanks to the loops), strings which are "currently" all merged into the primordial string (*A*, in Fig. 31). If we remained at this stage of the ontonomic model, we would never arrive at the phenomena. To go further, we must conceive, like the defusion of the onton into strings, a defusion of the strings which are confused in the primordial string.

In Fig. 31 we have the representation of such a defusion (*B*, *C* and *D*). This defusion means that the strings are no longer merged into one, but are disengaged from each other in a cluster of strings. Here a problem arises: should we content ourselves with a simple defusion with adjoining (*B*, in the figure) or go further? The principle of simplicity asks us, in a first intention, to stick to simple defusion. This defusion with joining of the strings produces, according to a geometric metaphor, an equivalent of "volume," a "package," a "block,"

of strings all glued to each other, as if the punctual being, the original onton , spanned three dimensions.

The ontonomic block can be described as follows: all the strings have demerged, but they remain attached to each other. The strings are of different lengths, without being infinite. From the primordial onton escape the two strings, ascending and descending, primordial. These strings extend in both directions, probably to infinity. However, there are changes in direction, from top to down and *vice versa*, at the level of the loops.

A priori, the ontonomic block is perfectly full, without holes, because there is no break in the course of the strings and all the strings are joined. However, breaks in the block still appear, as a consequence of the differences in string length. See Fig. 32.

In this figure, we have represented, from the primordial onton, the expansion of the primordial string in defused strings, with the loops (high ∩ and low ∪). Due to the differences in the length of the ascending and descending expansions, the string block is characterized by hollows, holes open upwards or downwards. In a pictorial way, we can say that at this stage of ontonomic conceptualization, the block is "porous:" it does not (yet) have internal holes, but open holes.

As is also represented in Fig. 32, it is now possible to represent the unfolding of the onton as an ontonomic block, a "matrix," made up of the defusion of the strings, which are joined to each other, but a porous block at the level of these two high and low surfaces and also as if grooved on its lateral surfaces, in both cases, these are the "voids" left by the string length differences after a loop.

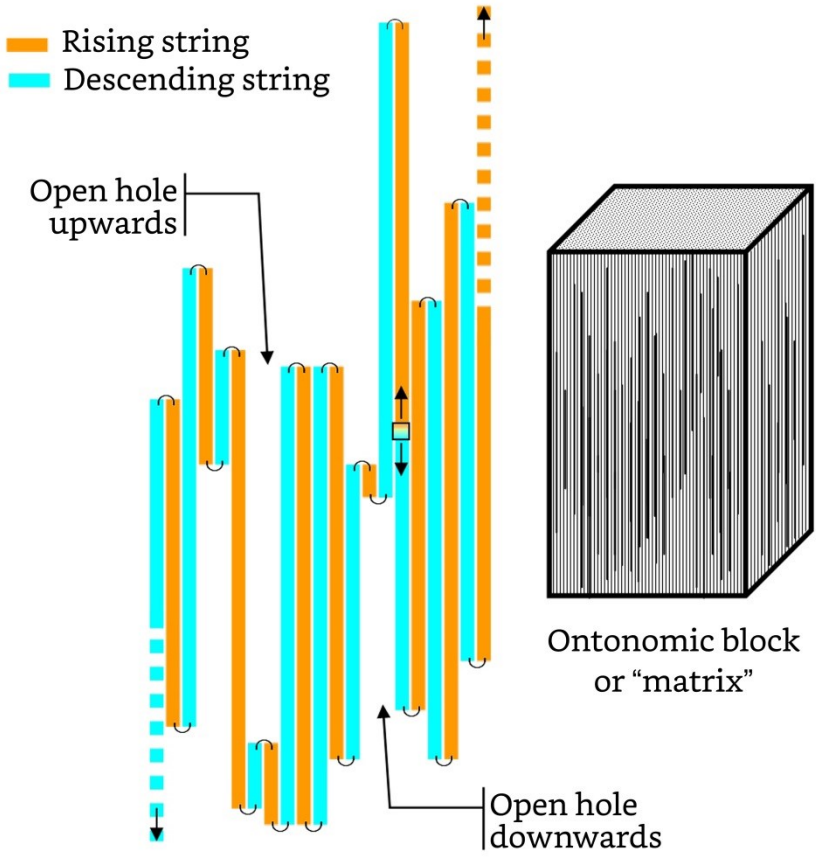

Figure 32: The loops, which allow the deployment of the ascending and descending strings, form holes by differential length of the strings. Thus begins to appear the ontonomic block of the matrix.

That said, this concept of a matrix represented as a parallelepipedic block should not be taken at face value. We do not yet know that it is the general “form” of the… infinite matrix, as an informational logical structure. But we will come back to this point later. In any case, with this fourth level of ontonomic unfolding, the unfolding of the strings, we approach the first “prephenomenal” step of the unfolding. Indeed, until now and following the principle of simplicity, we have not been able to introduce stochasticity, chance, into the ontonomic unfolding: the primordial onton unfolds in

strings without solution of continuity; the strings unfold in a compact block of contiguous strings. However, with the length differential of the strings, the chance appears, because this same principle of simplicity allows the strings to have absolutely any length. This chance, which makes the block grooved and porous, begins to bring out the information that will "later" constitute the phenomenal universe that we experience.

Another remark concerns the three-dimensional aspect of the matrix block. Again, it is important not to make the FOE to consider this matrix in a "three-dimensional," "spatially three-dimensional" way. It is information that is "three-dimensional" in the sense that its logical orthogonality can be represented, symbolically, as a volume. All that is represented here is like the information schema of a program computer, a decision tree and we must not give it any physical materiality.

Thus, having reached this point of development of the ontonomic model, we begin to approach the goal of the expansion of the onton, that is to say its phenomenal manifestation. This leads us now to no longer consider the concept of information as absolute. At the level of absolute being, opposed to absolute nothingness, information is itself absolute, in the sense that being does not play hide and seek with nothingness: "from the moment when the onton appears" (totally figured predicate), it signs the death certificate of absolute nothingness. This "nothing at all" which excluded even the slightest conception of itself, loses all relevance, all "existence" as a concept.

On the other hand, once the onton has "happened," it is a unit of information which unfolds towards the phenomenon, towards the phenomenal universe (since we are at the heart of this universe and participate in the phenomena). This information gradually goes beyond the initial simplicity to become more complex due to its very organization. It is for

this reason that the principle of extensive expansion of the onton requires considering what was not for the onton as an absolute unit of existence, that is to say the probability and the improbability. The onton, however, retains its absolute continuity along the strings it "forms," from top to down and from down to top, without any break. On the other hand, a first break appears in the matrix, due to the difference in length of the strings. This stochastic rupture is a source of improbability, therefore of information, thus prefiguring the phenomenal universe.

Earlier, when designing the onton, we had posed as a completely theoretical and contradictory concept, the existence of a "nihil," symbolized by {0} and opposed to the onton {1}. Indeed, the nihil, as a unit of absolute nothingness, is an aberration. Moreover, the expression "the existence of a nihil" is itself a beautiful paradox. By definition absolute nothingness excludes any notion of existence and we can no more say that absolute nothingness exists than we can say that M. Smith attends his funeral or that a razor cuts itself. However, we have suggested not stopping at this contradiction in order to conceive of a "symbolic" dimension to the nihil, like the controversial infinity in mathematics.

By conceptually examining the ontonomic block of the defused strings, the matrix, its porosity, the high and low holes and the "lateral" grooves, it finally raises the question "of what surrounds" this ontonomic matrix. Of course, here we are dealing with a FOE, which consists in conceiving the matrix within a kind of spatiality, itself occupying a space in space and being "surrounded," in fact, by something. This view is obviously totally wrong. As it is the matrix which will constitute the phenomenal experience of space, this matrix itself is not "spacious" nor does it occupy any space and is therefore not surrounded by anything. From the start, moreover, the primordial onton and the primordial chord are in no way inscribed in a space and are not as if surrounded by a "vacuum," since they are the precursors and "creators" of

subsequent phenomenal aspects of space, emptiness and fullness.

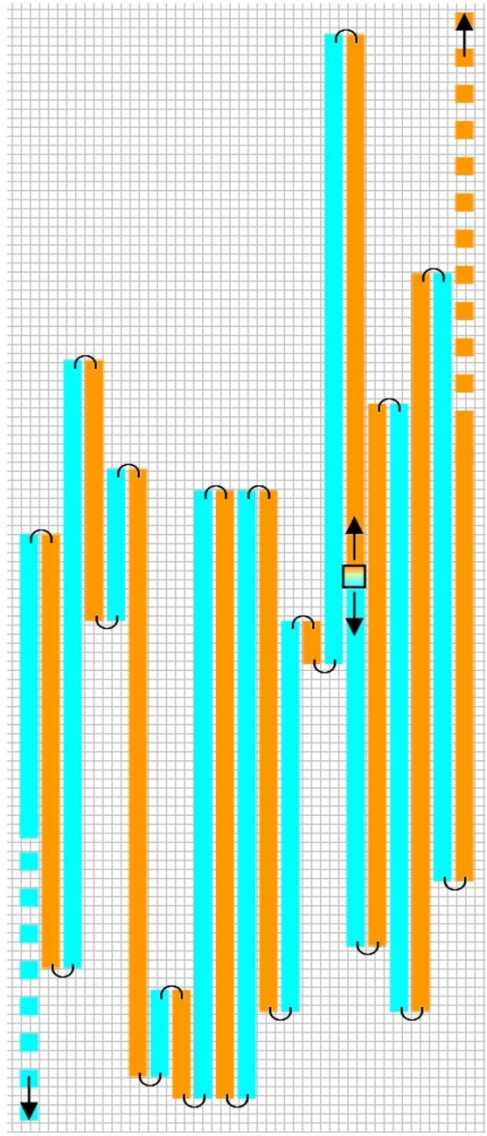

Figure 33: The information in the matrix is symbolically represented by the ontons (strings), surrounded by the "vacuum" of the nihils (grid).

On the other hand, from the informational point of view (since it is a question of information), we must take into account this informational duality, which manifests itself in the form of porosity and grooving, and which raises the question of this duality between the onton and what is not the onton. See an illustration in Fig. 33.

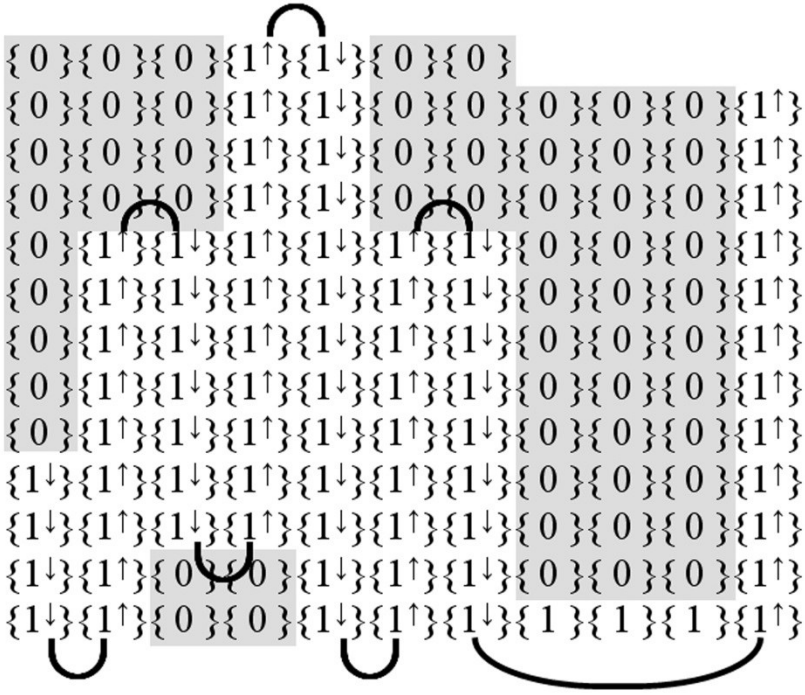

Figure 34: The binary informational nature of the matrix is represented by this complete filling of ontons ({1}) surrounded by nihils ({0}, on a gray background for more visibility). The loops (black curves) allowing the expansion of the onton in rising and descending strings.

It is therefore in response to this duality, an ontonomic dichotomy, which is a source of information due to its improbability and which will be reinforced at the next step of ontonomic development, that we appeal to the concept of nihil (symbolized by {0 }) opposed onton ({1}). In Fig. 33, the nihil is represented by the grid which fills the interstices between the strings of ontons (symbolic grid, do not take into

account the difference in size between ontons and nihils, from the informational point of view their "size" is identical). Anything that is not onton is nihil. In other words, the nihils occupy all the "space" between the ontons ("informational" space, of course). In Fig. 34, the representation with the capsules is more precise.

What we see more precisely Fig. 34, with the nihils ({0}, on a gray background), which surround or intersperse with the ontons of the rising ($\{1^{\uparrow}\}$) and descending ($\{1^{\downarrow}\}$), the lines $\cap$ and $\cup$ symbolizing the respective high and low loops. Thus, to the "holes" (pores and grooves) produced in the matrix by the length differential of the strings, are added "holes" by the defusion of the strings with more or less significant separation (at least a nihil difference). We will see in the next section another origin of the "holes" in the matrix, but already, these absences of ontons, interpreted as nihils, sign the binary informational nature of the matrix.

Fifth step of ontonomic expansion : the string refusion

The last stage of the ontonomic expansion, before the advent of phenomena, will consist of a refusion of the strings. This is again a new prephenomenal step, in the sense that the block of strings formed at the defusion step, which already includes the nihils resulting from the difference in length of the strings and from the defusions with detachment, will be enrich in more nihils by the fact that many strings will remerge together. Why such a refusion?

First of all, to understand the nihil from an ontonomic point of view it is necessary to think in an informational weave and to start from the idea that the concept of absolute nothingness has value, relevance, only if nothing or nobody refers in one way or another to this concept. This absolute absence of information means for us that there is not even any information to account for it (the reciprocal of the anthropic principle). But from the moment the onton

appears, even if it has not unfolded, that it does not yet give any phenomenal existence, this onton definitively abolishes the absolute nothingness, which becomes a relative nothingness, something "void" which "surrounds" being, either in terms of information, a difference in quality, an improbability. The nihil is therefore the symbol of this "relative nothingness," relative to the onton. The relationship between onton and nihil will be able to give rise to an organization of information and, eventually, to laws.

The nihil is also anthropically justified by the fact that, without it, the onton would remain deployed in an undifferentiated, "massive" form, therefore without being able to "express" information (it would not be a real expansion, the latter implying in principle the production of information). It is, to take an image, all the difference between, for example, a massive cube of steel and a cube of expanded polystyrene foam. In one there is no information (at a macroscopic level, of course, intra and inter atomic voids are not taken into account in this image), in the other, the voids and the solids form information.

If the matrix had remained at the stage of a simple ontonomic block of joined defused strings, no phenomenal universe could have "appeared." The nihil pores (not to mention the grooves at the edge of the matrix) give only very poor, linear, "static" information. Now, the matrix can do nothing else to increase the improbability, the entropy, within it, than to partially remerge its strings, because it can neither extend nor transform itself, it always remains an onton, unfolded in string and strings.

In the matrix, therefore, fusions, defusions and refusions appear, because the opposite movement is also present. This model makes it possible to distinguish between *elementary strings*, that is to say strings which are only one string, therefore without any potential for expansion by defusion; and compound strings, which represent a bundle of strings

fused into each other, in fact fused into one, thus possessing the potential for unfolding by defusion of the strings that make up the compound string.

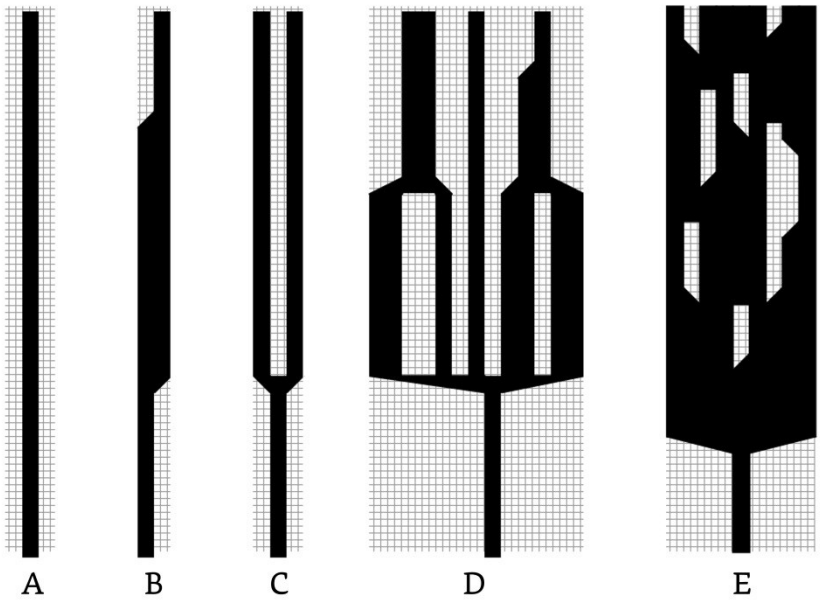

Figure 35: The different steps of the conceptual evolution of the ontonomical matrix, as fusions, defusions, and refusions of the strings.

The Fig. 35 illustrates our point (we omitted to distinguish between rising and descending strings, because we are entitled to consider all the possible fusion-defusion combinations between all the strings, whether rising or descending).

In *A*, we have represented an elementary string, which continues its route in the matrix, without ever splitting of course, but which could merge with another elementary string or with a compound string. In *B*, we have a compound string with a potential of 2 strings that defusion with joining, to refusion further. In *C*, we see a defusion of a string composed of 2, but this time with separation. Then, in *D*, a string made up of 8 elementary strings, defusion into 3

"packets" of 2 elementary strings joined together and 2 elementary strings separated. Subsequently, 1 packet of 2 and 1 string(s) refusion into a string composed of 3, 2 packets refusion into 2 joining strings which end up fusion in 1 single composed string, while an elementary string continues on its way. Finally, in *E*, a string composed of 9 elementary strings, completely defusions, to then present partial refusions, followed by refusions. Of course, all this seemingly spatio-temporal description is only metaphorical, just like when describing a road map one speaks of two roads that join, until the next crossroads, a few kilometers further on, where they separate again. Note that in this figure the background grid always symbolizes the nihils.

The consequence of the refusion of the strings, then of their defusion with separation, is quite visible on *C*, *D* and *E* Fig. 34: in the matrix, there are no longer only pores and grooves, but also bubbles of "emptiness," of nihil, entirely embedded in the middle of the ontons. These bubbles are therefore produced in three ways: 1) from a high or low loop (pores and grooves); 2) from a fusion that generates a vacuum instead of the fused string; 3) from a defusion with detachment, which generates a vacuum between the two strings. The matrix therefore takes the form of expanded foam.

The orthogonalities of the ontonomic matrix

During the second step of the ontonomic expansion (the string), between the two representation options of the expansion, "stochastic" or "linear," we chose a "linear" representation, in order to avoid the FOE of a spatial type expansion "in all directions" (Fig. 29). The expansion is linear, in the form of a string, because it is the only way to continue the model in a strictly informational weave, linearity meaning the simple multiplication of the onton. The primordial onton contains all the derived ontons (in a way) which will form the primordial string. Then, the

derived ontons (as a multiplication of the primordial onton) are linked to each other, without breaking, like a stack of ontons.

Of course, the linear representation could also be the subject of an FOE in the form of a spatialized line. However, while with the stochastic representation it would be difficult to see in it a representation of information, out of time and space, conversely, the linear representation makes it possible to avoid the FOE and to design an information train totally symbolic. In other words, all these representations of ontons, strings, loops, etc. are figuration of the properties of the generative information of the universe.

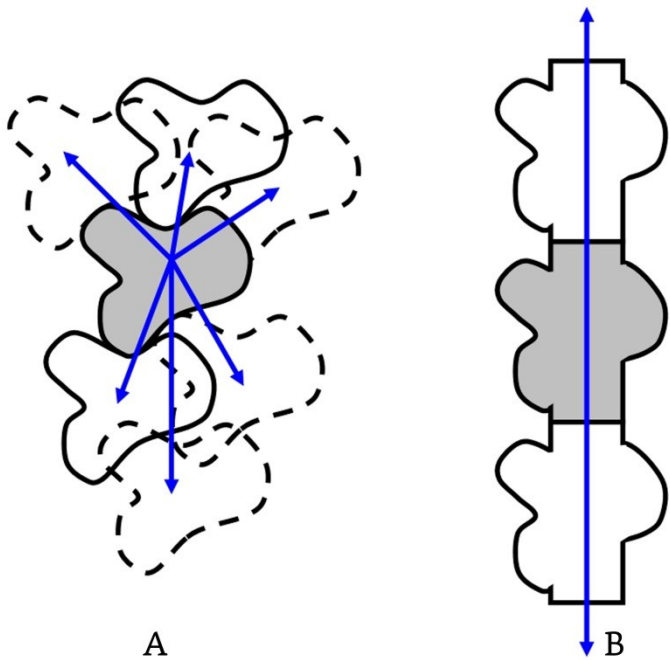

Figure 36: First orthogonality (the onton).

From an informational point of view, like a train of bits with a value of "1," the ontons are linked in a quantum way (there is never a fraction of an onton, but always a whole

onton), joined together to the others, following a linearity of representation symbolizing the absence of any spatialization option for the ontons. Fig. 36, at *A*, we have represented the stochastic option of multiplying the onton (in grey). The onton has no form, it has no quality, since it will be at the origin of forms and qualities. For that, we represent it here in a "shapeless" way, anyhow. Its multiplication is also "shapeless," "anyhow" (the dotted ontons), which clearly refers to a form of spatiality and which makes no sense from an informational point of view.

In *B*, the informational succession of the onton (in grey) is represented by the flat surface, "above" and "below," of the onton. A flatness that defines a linearity, symbolized by the vertical axis (the double arrow). In other words, on either side of an onton, there is no informational choice other than another adjoining onton and on the axis of a string (this is symbolized by onton reproductions on both sides). This representation, at the base of the primordial string, which conceptually connects onton and string, is the first "orthogonality" (between onton and string).

Now let's move on to the expansion of the strings. Fig. 37, elementary strings unfold on either side of the compound string in the center. This unfolding is depicted in *A* stochastically, which refers to a spatiality, an FOE, suggesting that the strings could unfold in this or that way or anyhow, in a space. In *B*, the representation agrees with the principle of simplicity of ontonomic expansion and with the informational (and no longer spatial) character of the model. The strings unfold in a quantum way, it is just information "parallel" to other information, which is symbolized by the orthogonality of this unfolding (the different axes of "horizontal" unfolding, with the double horizontal arrows) and the ontons "to the left" and "to the right" of the base onton. The two orthogonalities (of the onton and of the string) result in an orthogonal geometric representation of the onton.

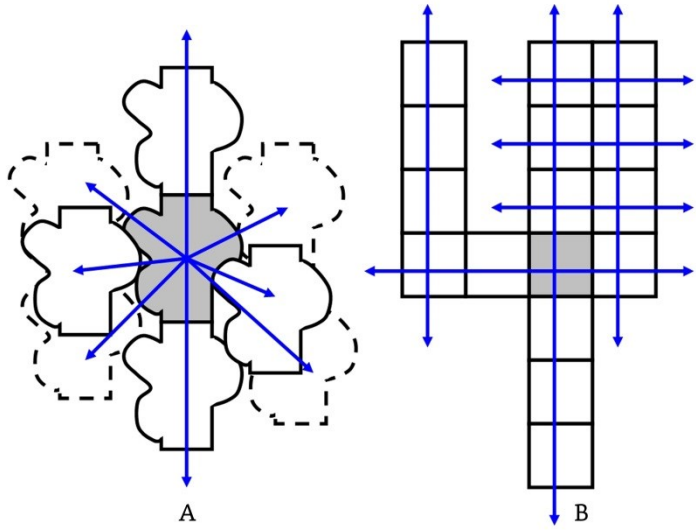

Figure 37: Second orthogonality (the string).

There is no reason to stop on such a good path. Starting from the primordial string, our representation of defusion, which sees two strings unfolding “to the right” and “to the left” of the compound string, is a very limited representation of defusion, because nothing prevents us from conceiving more of two defusions (“right” and “left”) from a compound string.

In fact, if we observe Fig. 38, we can see that by continuing according to the principle of orthogonalities, other defusions are possible. Let’s take a compound string (on the left) and make a plan section of this string.

This shows a plan view of the string, as shown (grey square) in the center of the nine-tile mosaic. According to the principle of orthogonality, from this central onton can unmerge four strings (dark arrows). Then each of these new strings can, itself, defusion with at least one new string (light arrows). The whole gives us a tiled surface, still in cross section, but still a volumetric assembly of “cubes” in three-dimensional representation, i.e. a cube to represent the

onton, what we will consider as the third basic orthogonality (the onton and the volume matrix).

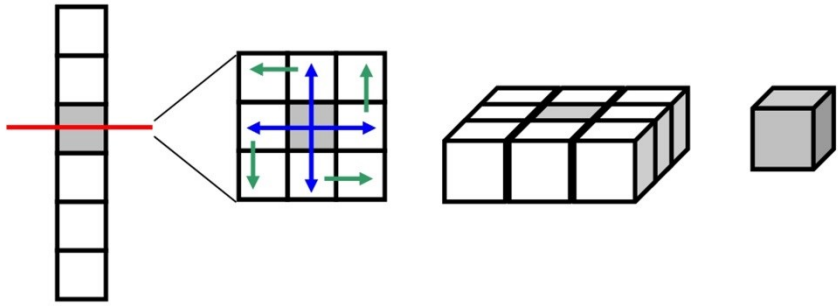

Figure 38: Third orthogonality (the onton and the volume matrix).

As a result, it is possible to figure a three-dimensional representation of the ontonomic matrix. Fig. 39, a portion of the matrix has been represented, in a three-dimensional form which perfectly illustrates the three basic orthogonalities of the matrix. With the representation of a "vertical" cutting plane in the length of the strings. This plan makes it possible to represent the onton, the string and defusions (first and second orthogonalities). And the "horizontal" cutting plane, perpendicular to the strings, which makes it possible to represent the onton and the defusions of strings (second and third orthogonalities).

Can we stop there? No, because nothing forces us to confine the unfolding of the onton and the strings to this "three-dimensionality." In fact, such representations are a source of FOE, of a "spatial" conception of the matrix. Beyond the three basic orthogonalities, there are an infinity of other orthogonalities, this so that the onton unfolds according to its full potential for complexification.

Coming back to the strict point of view of information (and far from any three-dimensional spatial FOE), a string can spread out over much more than four strings if we consider a multidimensional representation of information.

Hence, the cubic representation gives way to hypercubes, i.e. an n-cube that expands in n dimensions[86].

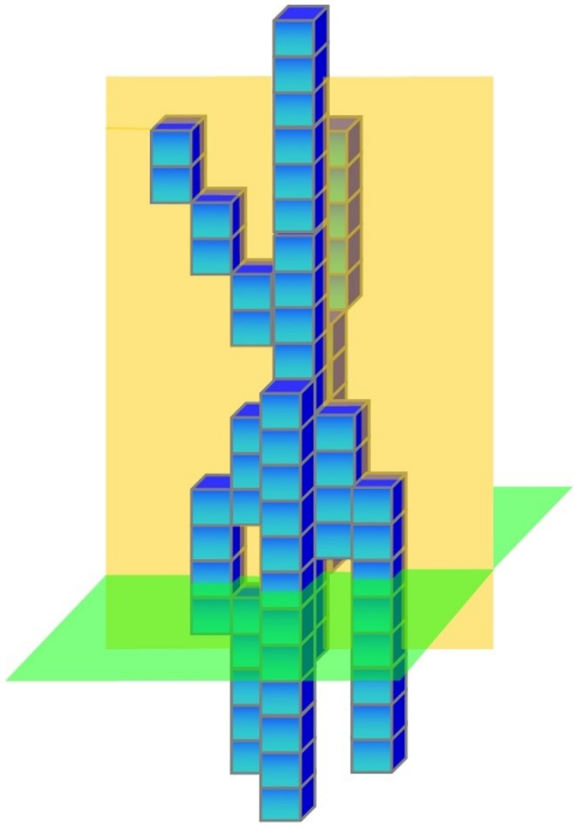

Figure 39: Three-dimensional representation of the ontonomic matrix.

For lack of being able to represent the multidimensional nature of the ontonomic matrix on the plane of a sheet of paper or a computer screen, by convention, we limit ourselves to representing the matrix according to the "horizontal" or "vertical" cutting planes or in a three-dimensional way. However, this is obviously a very rough approximation.

In summary, the informational ontonomic matrix is a single onton, deployed by duplication of itself, following

an orthogonal structure made of strings, surfaces, cubes and hypercubes. The differential of the lengths of these strings, by means of loops and the alternations between fusions, defusions and refusions of the strings, form nihils, which are non-ontons. The improbable or regular alternations between ontons and nihils form a binary informational matrix.

The informational ontonomic matrix "block"

Everything that has just been described (onton, nihil, string, surface, volume, hypervolume), with properties such as binarity, orthogonality, fusion, defusion, and refusion corresponds to a global concept, that of informational ontonomic matrix. This concept means that the ontonomic matrix in hypercubic n-dimensions, corresponds to a definition of the universe, a kind of program of the universe as a whole, universe understood as space-time phenomenal universe.

This ontonomic matrix is "static," it forms a "block," in the sense that it only exists, without evolving. To take an image, in the flash memory engraved of an SSD, nothing moves (in this image we are talking about bits of information that are immobile and we are neglecting molecular or atomic dynamics). The dynamics will reappear only when an external processor comes to "scan" and "read" this memory.

In a certain sense, knowing that the ontonomic matrix is "prior" to any phenomenal existence and that it defines all phenomena, we can say that "everything is already written," it is the universe block. However, we must be careful not to conceive this "everything is already written" in an anthropomorphic, teleological and religious way. We are not speaking here of Destiny, of the "Big Book" in which God, etc. Nor do we question what we can currently understand of free will on a philosophical level. The matrix contains free will itself.

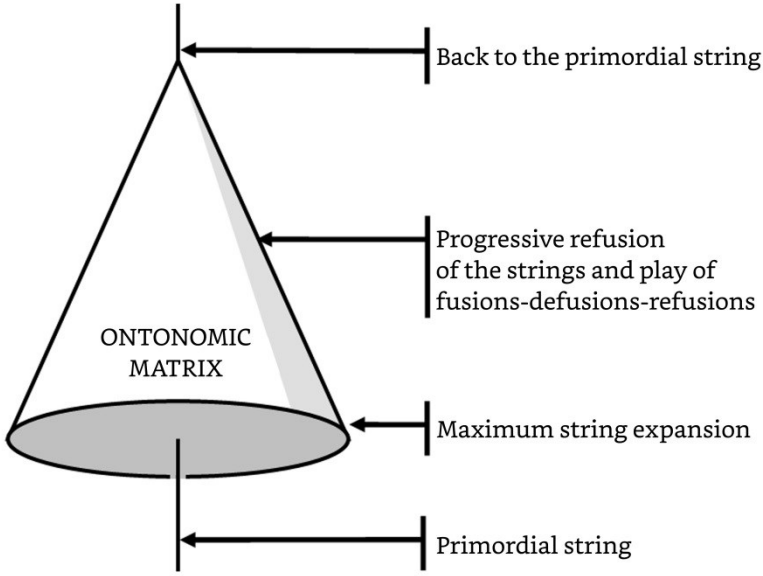

Figure 40: Hypothetical general structure of the ontonomic matrix.

At the current stage of development of the ontonomic model it remains difficult to describe the global structure of the ontonomic matrix, its general informational form. However, the logic of the ontonomic deployment authorizes to imagine a matrix rather close to a cone (see Fig. 40), whose base would symbolize the complete expansion of the joined cords, starting from the primordial string (itself produced by the primordial onton); then the progressive thinning of the form as the refusion proceeds, marked by all the undulatory informational "dynamics" of the fusions and defusions; all this towards a return to complete refusion in the primordial string. This is, of course, a provisional and very theoretical hypothesis, which would agree fairly well with the concept of Big Bang, but which would not account, it seems, for either inflation (envisaged) or expansion (observed). However, it would be an FOE to spatialize the matrix and one can conceive of inflation and expansion within the framework of

phases of fusions-defusions-refusions impossible to represent in the form of this informational diagram.

The playing hypersurface

We have just described the informational ontonomic matrix which contains all the information of the universe throughout the duration of the latter. This means that the ontonomic matrix is not itself inscribed in a temporality, nor even a spatiality, which are phenomenal frames. The matrix is just being in its total expansion. Having arrived at this point of pre-phenomenal unfolding, how is the phenomenal universe generated? How do space, time, matter, energy, life, consciousness appear?

All things considered, the ontonomic matrix can be compared, in principle, to a computer memory (a DVD disk, a flash memory, a hard disk, etc.): information (for example, a video film) is recorded in this memory under the form of coded information of the binary type (1 and 0). However, no matter how much we scrutinize and manipulate the DVD disc in all directions, we will never see the film without a playback system that will play the information, interpret it, and finally render a film on a computer screen.

In the same way, the phenomenal universe coded in the matrix can "emerge" from it only from a system of "reading" of the matrix, which will interpret the information "coded" in the form of ontons and nihils, into complex phenomena: from the most elementary particles and their interactions, to the movements of clusters of galaxies, the explosion of supernovae and the gravitational collapse of black holes, passing through the developments of life, consciousness and culture.

Moreover, these phenomena are inscribed in a spatiality and a temporality. The matrix being out of time and space, it is therefore what will play the matrix which will manufacture time and space, like (and always all things

considered) the laser playing head which interprets the microscopic holes and bumps of the DVD disc into a cinematic reality, evoking a spatial universe, inscribed in a temporality (the film lasts a certain time).

Without yet being able to explain the nature of *what* plays the ontonomic matrix, we can put forward the idea of a "surface" of playing, which evolves along the axis of the strings, "reading" and "interpreting," layer after layer, the structures of ontons and nihils. Fig. 41 shows a block diagram of such a "reading system."

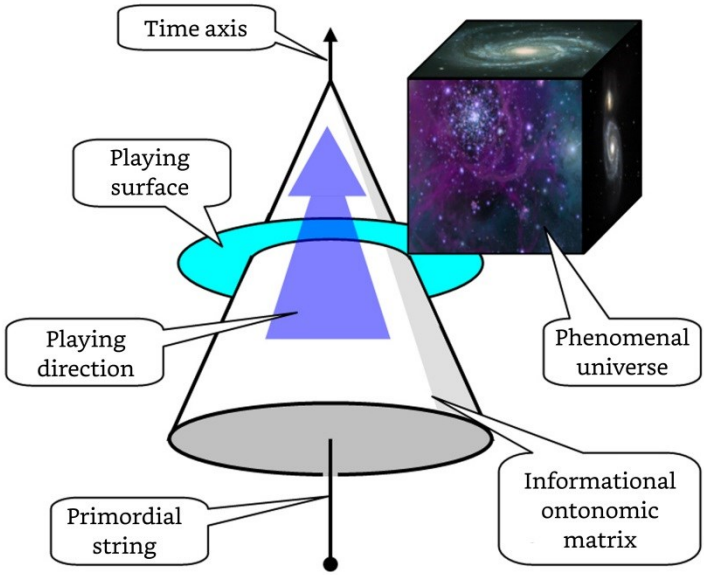

Figure 41: Principle of the playing of the informational ontonomic matrix. The playing surface glides at the speed of light along the time axis of the matrix, interpreting a three-dimensional spatial phenomenal universe, flowing in a time dimension.

The ontonomic matrix is organized along two axes: 1) the "time axis," which is parallel to the primordial string and to the strings deployed from this primordial string; 2) the "reading surface," which is orthogonal to the time axis. This

playing surface corresponds to a thin "layer" of the informational matrix, which translates, in the quantum weave, into a layer the thickness of a Planck length (10^{-35} meters). The playing surface slides along the time axis, jumping from one layer to the next, at the speed of a Planck time (10^{-44} seconds). Suffice to say that the playing is done at the speed of light, which, by the way, confirms this speed as the speed limit, unsurpassable in the phenomenal universe. You cannot go faster than the music… Nothing can go faster than the playing speed of the matrix.

The playing surface moves from "bottom" to "top," along the time axis, interpreting a thin layer of ontonomic matrix as an instant of spatio-temporal universe. As the surface rises through the matrix, the surface plays other successive moments of the phenomenal universe. As it produces the phenomenal universe, the playing surface is said to be "phenomenogenic" (which generates the phenomena).

In other words, by sliding along the "vertical" temporal axis (time axis), the phenomenogenic surface "reads" the matrix which is interpreted, from time quanta to time quanta as a three-dimensional universe succeeding itself in what seems to us like a temporality. We can understand this with the metaphor of the medical x-ray scanner. Following this analogy, the examined body is the matrix. The scanner slides along this body, following a succession of fine cuts whose information is analyzed by a computer capable of reconstructing the interior of the body in three dimensions. However, this metaphor remains approximate, the scanner restores a three-dimensional image of a body from all the digitized slices, while the phenomenogenic surface restores a moment of three-dimensional universe in its entirety for each slice!

Considering the local universe[87] as a whole, 5.4×10^{-44} seconds of this universe is "described," at the informational level, by a phenomenogenic surface, a slice of ontonomic

matrix 1.62×10^{-35} meters thick, i.e. of a single layer of onton. Of course, this is a "hypersurface" that contains many more ontons and nihils than if it were the mere surface of a universe-sized DVD, etched at the quantum level. Each onton opens onto other orthogonal dimensions and other ontons. Let us not forget that the informational ontonomic matrix is an infinitely multidimensional Hilbert space. This hypersurface of ontons is binary, it comprises only ontons and nihils, a coded set of "1" and "0" whose different configurations and organizations "code" our entire universe, in its three spatial dimensions and during a temporal quanta.

At each "temporal quanta," the playing surface advances by a "spatial quanta," determining the next layer of ontons. In fact, concerning time, things should be described inversely: it is by its circulation in the ontonomic matrix that the playing surface creates time. And the direction of the playing (from "bottom to top" of the matrix) creates the "arrow of time," that is to say the irreversible character of time, in the order past, present, future. We could take the image of a film strip. This film contains all the images of the film which follow one another, attached to each other like on a ribbon. If we slice each image to stack them on top of each other, the entire stack will represent the three-dimensional ontonomic matrix. The playing surface is each image, considered one by one. The process of phenomenal actualization (the phenomenogenic surface) passes successively through each image, which it "reads," "interprets," "decodes," which in succession gives the film, a complex picture in motion, inscribed in a temporality (the film "lasts"). That said, and this is the limit of this metaphor, for which each playing surface is only a simple surface covered with colored pixels; while with respect to the ontonomic matrix, each playing surface is a hypersurface of ontons and nihils.

This metaphor of the film strip leads us to ask the question of the size of the picture, that is to say, to return to the

ontonomic model, what is the size of the playing surface as surface? To answer this question, we must address the question, not only of the local principles of the expansion of the onton, but of the general principles of this expansion, that is to say, how the onton is deployed in its totality.

Steps of the global expansion of the onton

This section describes the four hypothetical steps of the global onton expansion. Initially[88], the *primordial onton* (as a "point" of existence) unfolds as a set of fused cords. It can therefore be described as a single string, but which potentially contains all the rising and descending strings, it is the *primordial string*. Then the onton, which has therefore begun to unfold in the strings, will continue its unfolding in the defusion of all the strings. The principle of economy dictates to us the simplest event possible, that is to say **the total expansion of the onton in the form of the total defusion of all the strings.**

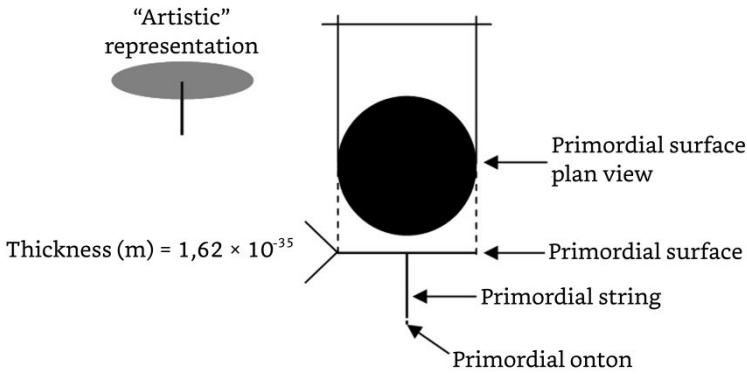

Figure 42: The first three steps of the global expansion of the onton. From the primordial onton (point), the onton multiplies into a primordial string (line), which defusions into a primordial and multidimensional surface.

The onton thus goes first of all through three steps: 1) as ontonomic unit (geometric equivalent of the point); 2) as a compound string and hence the totality of the fused

elementary strings (geometric equivalent of the line); 3) as totally defused elementary strings (geometric equivalent of the surface). This third step corresponds to a wave of defusion which propagates to all the strings, in an infinity of informational dimensions, one can thus speak of a "hypersurface."

In the end, the onton is completely deployed, forming a multidimensional surface full of the whole onton, the *primordial surface*. By convention, this surface is a finite area, conventionally represented (Fig. 42) by a solid disc (the joining of the strings is total, without any nihil), thick of an ontonomic unit, the hypersurface dimensions being not represented, because not representable.

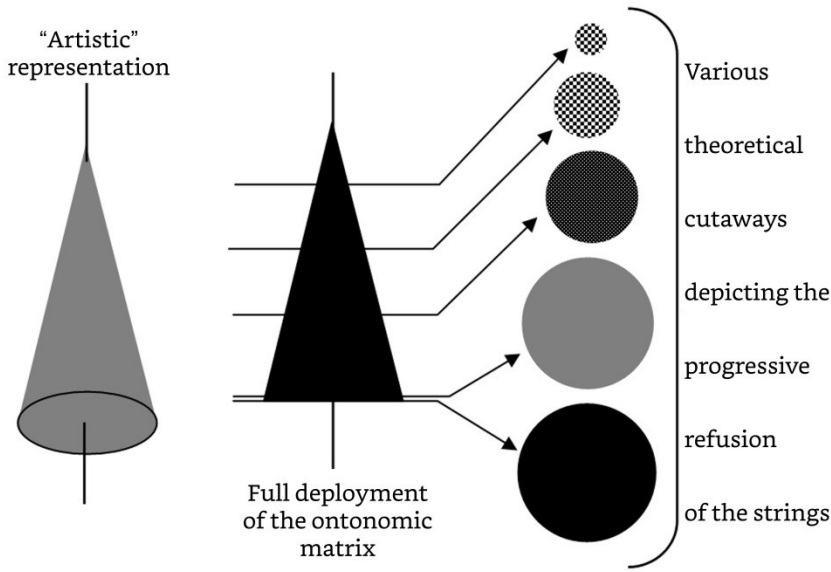

Figure 43: Fourth step of the global deployment of the onton. After total defusion, the matrix gradually refusions all its strings, until the return to the primordial string.

"Then," the fourth step (see Fig. 43) corresponds to the expansion of the ontonomic matrix, with the extension of all the defused strings, which obey the great undulatory game of

fusions-defusions-refusions. For example, one can imagine that just after the primordial surface, the matrix passes through a surface of refusion of the cords in pairs, which gives, in the plan, a kind of checkerboard (black boxes – ontons, alternating with white boxes – nihils), which also needs to be considered in hypersurface dimensions.

Gradually, one can always assume that the matrix continues its expansion towards total refusion, for a return to the primordial string, merging all the strings. The profile of this progressive return can, in a first intention, be represented as an isosceles triangle (temporal plane) or a cone in three-dimensional "artistic" representation. If we consider various surface levels cut into this cone, we see a progressive invasion of the nihil into the onton, corresponding to an increasing refusion. Given the proportion of "vacuum" observed in the "current" universe, it can be estimated that the playing surface is located in the "upper" part of the cone.

Scientific utility of the ontonomic model

The "classical" models consider the universe, according to our experience of it, as a spatio-temporal structure, relative to the observer, populated by different "particles," matter and forces, which interact with each other, according to the laws of cause and effect. So, when you are peacefully seated on a felled tree trunk, meditating in the heart of a forest, contemplating the nature around you, up to the clouds in the sky and the sun whose rays filter through the foliage, you can imagine all this (and yourself) as a vast collection of "particles," from those that make up atoms (themselves grouped into molecules) to those that form light, photons which bounce here and there and which end eventually enter your eyes to stimulate your brain's visual system.

The approach according to the informational ontonomic model is quite different. The substrate of the spatio-temporal universe and its "particles," of matter as well as of forces, are

the result of an informational, binary and multidimensional matrix (a Hilbert space). This scene of meditation in the forest and the person who is meditating and all this "particular" universe are as if "encoded" in a matrix whose information "describes" the whole universe, in its spatial entirety, but also throughout its time course. The matrix itself is neither in a space nor in a time, since space and time come from it. A "reading head" plays and interprets this matrix and draws the space-time universe from it. The matrix also possesses the information that corresponds to the development of living organisms and, among them, thinking and conscious organisms, aware of the matrix, as if the matrix wanted to "think itself."

Thus, sitting on a felled tree trunk, the informational ontonomic model should lead you to imagine that a "quantum" of your hand is in total continuity of existence with a "quantum" of the tree trunk and with a "quantum" of any thing or energy in the universe. You can imagine a string that comes from the past, crosses your hand, extends to the future, makes a loop, "comes down" to your present and crosses the tree trunk. From moment to moment, the cosmic playing head plays this rising and descending double string, determining and actualizing the existence of two "quanta," one in your hand, the other in the tree trunk, finally actualizing all the "quanta" that constitute all things in the universe, yourselves and those photons that enter your eyes to activate the visual system of your brain and the whole universe from its birth to its end.

In fact, when we consider each portion of this universe, we must see each time a bundle of billions of billions (an infinity, in fact) of strings which form a complex pattern, presumably of fractal nature, organized in several hypercubic dimensions. From our point of view as organisms actualized from this bundle of strings, we represent it as going from the past towards the future, the bundle being itself outside of all temporality. We represent it to ourselves as a thing having a

thickness, occupying a place, whereas this bundle is outside of all spatiality.

The matrix is not in a space nor in a time; neither in space nor in time. It contains information of a binary nature, alternations of ontons ("1") and nihils ("0"), coded for each instant of the universe in a hypercubic structure and raises the question of the nature of this "code:" what is the relationship between the organization of ontonomic information and the phenomena of the universe as we experience them? In order to pursue the momentum of the principle of economy, we can suggest here that this relationship must be essentially topological, even **only** topological.

A topological relation means that a "particle-wave," an atom, a molecule, a planet, a star are encoded in the matrix like the place of ontons and nihils with respect to each other. For example, the core of a hydrogen nucleus, the proton, corresponds in the matrix to a composed string of low weight (compared to a planet, for example)[89]. Then, the single electron which forms an electronic cloud can be described, in the ontonomic matrix, as a bundle of practically elementary strings, each rapidly undulating, which corresponds to a cloud of probabilities of the existence of the electron.

But if we refer to the model of quantum physics, we no longer conceive of this too perfect distinction between proton and electron: we can describe the hydrogen atom as a heterogeneous bundle of strings, with a form of condensation of strings in the center and on the periphery a kind of "zone of influence" formed of undulating strings. Thus, when the phenomenal surface "reads" such a portion of matrix, it translates it into a lasting hydrogen atom phenomenon, as a probability field of particle-wave density.

At a more "macroscopic" level, for example that of the solar system, one can conceive of an enormous bundle of condensed strings, constantly in rapid fusion-defusion,

forming our sun. Then, smaller bundles of strings for each of the planets, forming whorls around the central solar bundle. Between all these beams, vast expanses of nihils where we encounter a few compound strings corresponding to the usual density of atoms in the space vacuum and to passing "particles" (solar wind, cosmic rays, etc.). Without forgetting, a very fine network of elementary strings which fills all space and which is at the origin of the fluctuations of the quantum vacuum, the appearance-disappearance of virtual particles. Thus, when the phenomenal surface "reads" such a portion of the matrix, it translates it into an enduring solar system phenomenon. So much for what concerns some suggestions of the "topological" relations between the informational ontonomic matrix and phenomena in the universe.

After these few considerations, we can say that the basis of the heuristic of the ontonomic model is to wager that the back-translation, the interpretation, of phenomena in the universe in terms of an informational, binary, multidimensional matrix, could advance things in many sciences: physics, cosmology, chemistry, biology. The ontonomic model would make it possible to bring many theoretical fields, often incompatible (such as general relativity and quantum mechanics) to a common mathematical formalism, describing structures of the ontonomic matrix.

One of the major predictions that the ontonomic model can already formulate is that all phenomena, whether physical, biological, psychological, sociological, economic and so on, are quantum and binary in nature. This "quanticity" and this binarity can be discovered both in the most tenuous roots of phenomena, and in their broad overall orientations.

We know, at the beginning of the twenty-first century, that physics is assailed by *ad hoc* hypotheses which struggle to make it progress any further and which horribly

complicate the overall picture, without however satisfying certain intellectual ambitions, such as that of a theory of everything. Dark matter, dark energy, multiplication of "dimensions," Higgs boson, antimatter… so many theoretical tinkering which could, perhaps, be advantageously replaced by an underlying informational ontonomic matrix, whose arrangement of strings would form the weave of all phenomena.

The structure of the hypermatrix

All that has just been described of the informational ontonomic matrix, that is to say a matrix of ontons and nihils, forming a hypervolume, multidimensional, concerns ONLY our local universe, the one in which we live.

However, it should be remembered that the matrix as a whole is described as a multidimensionally multidimensional Hilbert space. Remember the Everett multiverse. But where are all these universes located? Let's go back to the nice analogy of the Hotel Hilbert. Between two bedroom doors open corridors leading to other bedrooms, in other dimensions and this *ad infinitum*, so that as many infinities of infinities of travelers can arrive, there will always be room at the Hotel Hilbert!

In fact, we must not consider the onton as the beginning or the end of everything. The onton contains, itself, all the universes of the multiverse, it is its informational potential. And, when the onton unfolds (string, surface, volume, hypersurface, hypervolume), it multiplies, unfolds, all the more so its informational potential. This means that you have to see each onton as containing a multiverse, but also, to see *our* informational matrix, the one that allows the actualization of *our* universe, as embedded in ONE onton. This onton being one of the ontons defining a universe of dimension higher than ours. And so on… Fig. 44, we will see how this informational ontonomic "hypermatrix" is

structured, this matrix of matrices, which is at the base of the multiverse[90].

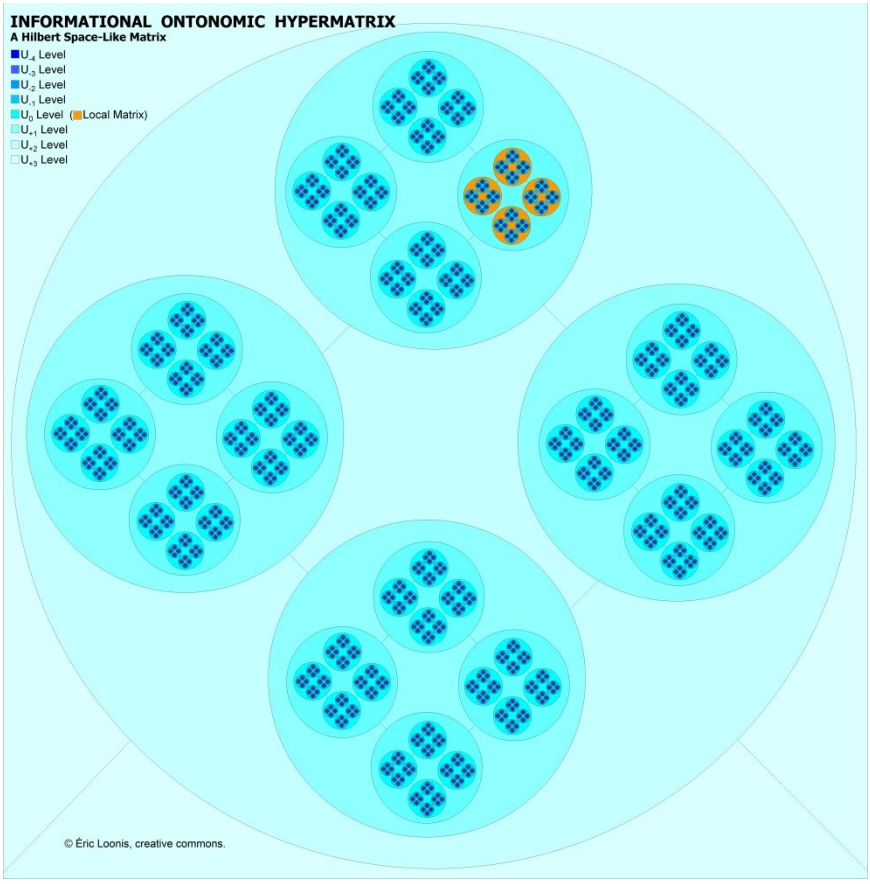

Figure 44: Informational ontonomic hypermatrix (schematic diagram).

To fully understand this diagram, it is important to remember that each structure of four circles, at the four corners of a rhombus, represents a matrix, corresponding to a universe. The four circles therefore symbolize all the rising strings, all the descending strings, all the high loops and all the low loops. Thus, seeing these four circles, you must imagine a matrix containing an infinity of ontons and nihils.

For example, the four dark gray circles (orange on the colored original) symbolize the informational ontonomic matrix from which OUR universe is actualized: the local matrix. You can then see that each onton of this matrix contains a lower level matrix. But moreover, our "local" matrix is itself included in a higher level onton. If you look closely at the diagram, you will see that are represented, at inside the U_0 level ("U" as "Universe"), the lower levels: U_{-1}, U_{-2}, U_{-3}, and U_{-4}. In the other direction, encompassing the level U_0, the levels are represented: U_{+1}, U_{+2}, and U_{+3}. This is, of course, only a very simplified diagram, because the lower and upper levels at our local matrix are in infinite number. Not to mention that each level has an infinity of matrices at the same level. We are indeed in an informational Hilbert space.

It is possible to describe things more precisely as follows: the onton, which refers to us, which generates our universe, is called "onton zero" (O_0). It forms (due to its expansion in strings), with the other ontons at zero level, the zero matrix (M_0), the matrix which generates our universe. Each onton O_0 of the matrix M_0 contains a level -1 matrix (M_{-1}). Each onton O_{-1} of the level M_{-1} matrices contains a level -2 matrix (M_{-2}) and so on, up to infinity: $\mathbf{M_0}$, M_{-1}, M_{-2}, M_{-3}, M_{-4}, … , M_{-n}, … , $M_{-\infty}$.

If we start again from the matrix of ontons of level 0, this matrix is integrated into an onton of level +1 (O_{+1}), which forms, with the set of ontons of level +1, a matrix of level + 1 (M_{+1}). Matrix itself integrated into a level +2 (O_{+2}) onton which forms with the set of level +2 ontons a level +2 matrix (M_{+2}). Matrix M_{+2} integrated in an onton of level +3 (O_{+3}) and so on, until infinity: $\mathbf{M_0}$, M_{+1}, M_{+2}, M_{+3}, M_{+4}, … , M_{+n}, … , $M_{+\infty}$.

The complete series of stacking ontonomic matrices can be represented as follows:

$$M_{-\infty}, \dots, M_{-n}, \dots, M_{-4}, M_{-3}, M_{-2}, M_{-1},$$

$$\mathbf{M_0},$$

$$M_{+1}, M_{+2}, M_{+3}, M_{+4}, \dots, M_{+n}, \dots, M_{+\infty}$$

Knowing that these series, between two informational infinities, are to be multiplied by the infinity of the ontons in each matrix (O_∞). Which can be represented with the following formula:

$$O_\infty (M_{-\infty}, \dots, M_{-n}, \dots, M_{-4}, M_{-3}, M_{-2}, M_{-1}, \mathbf{M_0}, M_{+1}, M_{+2}, M_{+3}, M_{+4}, \dots, M_{+n}, \dots, M_{+\infty})$$

What we must therefore consider is a "hypermatrix" (as we say a hypercube), the matrix of matrices or a **multimatrix**, the counterpart of the multiverse. Now, if we take an onton in the hypermatrix, this onton has, around it, a portion of the multiverse containing "neighboring," "parallel" universes. Which means that all these "close" universes are practically identical, with a few small variations. And these nearby universes are infinite in number. On the other hand, if we consider a "distant" onton (one could say "infinitely distant"), we will have other universes, but completely different from the universe of reference, with completely different potentialities of actualization (for example, other natural laws).

In any case, around our reference universe, there is an infinity of almost similar, parallel universes, in which it is possible to "leap." These universes are in us, in things, or we are in them. These are the ontonomic levels -1, -2, -3, -4, -5 … and levels +1, +2, +3, +4, +5 … .

Let's take a concrete example. In the U_0 universe, ours, a fatal road accident occurs for David. This accident, resulting from the collision of two vehicles, is "written" in the matrix M_0 (from which U_0 is actualized) as two converging trajectories of causes and effects. Let's say that this accident happened within 1 second: within 1 second, the vehicle that was to hit David's vehicle might not hit it, just brush against it and end up in the ditch. However, these possibilities, during this delay of 1 second, exist in the layers of universe U_{+1} and U_{-1}.

In these layers of parallel universes, there are all the variations "within 1 second" for which the accident does not occur or not completely, where David remains alive, where David is handicapped, where David only has minor injuries, where David is unharmed by simply witnessing the loss of control of the other vehicle, where David narrowly avoids the other vehicle, etc.

By knowing that each matrix makes it possible to actualize a universe, you can have a little more precise idea with regard to the multiverse: infinities of universes which coexist or which are fitted into each other *ad infinitum*. It is these universes, more or less parallel to ours, that it is possible for you to reach from the meditative technique, already presented in the first chapter and which will be deepened in the following chapters.

Now, a big question arises again and again: **who is "playing" the matrix?**

TRAVELING THROUGH THE MATRIX

We have now almost reached the end of our long journey, which has made us discover the mysterious paradoxes of Mādhyamaka, the tetralemmas of Nāgārjuna, Buddhist emptiness, as well as the enigmatic concepts of quantum mechanics, particle-wave duality, entanglement, spatial and temporal non-locality, the quantum weave. We arrived at the last base camp before the summit. We discovered there the very nature of the informational ontonomic matrix, a genuine Hilbert space, infinite multidimensional, a fractal structure in which all the universes of the multiverse are nested.

This matrix is "played," following a playing hypersurface, a kind of hologram which slides in the matrix, at the speed of light and which makes it possible to actualize, at each Planck time, a fraction of an instant of universe. But, as we specified above, for the moment our conception of the matrix is "playerless," without taking into account the "player," without specifying who this player is, nor how he "plays," how he takes to transform information into phenomena in a universe.

This point is important, because if we want to be able to "travel in the informational matrix," to change universe, we will have to move to a "with player" conception of the matrix

and include this famous "player." Again, let's look at the "Gandavyūha Sūtra" and see what it tells us about this player.

"In the Ultimate Reality, the Dharmadhatu, there is only one Mind. It is not a universal consciousness, it is not a transcendence, it is not a god. He is the Dharmadhatu itself. This Mind is the Ultimate Reality, which makes possible the universe and all its particular objects, its phenomena. So everything contains that Mind, the Dharmadhatu. This is how if one considers only one of these innumerable things in the universe, a single grain of sand, from this single phenomenon one can attain Dharmadhatu and clearly perceive emptiness[91]."

"Only one Mind." The answer is given to us, it remains for us to explain it to understand it well.

The Observer

As you will have understood, we are in a block-universe which is defined not only by our local matrix, but also by the hypermatrix in which our local matrix is set: the infinite set of universe matrices nested together in others. To fully understand what is, already, the consciousness of each of us, we must situate ourselves well in relation to this universe-block, as an observer in this matrix actualized in universe (Fig. 45).

The quantum weave comes from the informational ontonomic matrix, it is its first phenomenal emanation. Every conscious observer is on the hypersurface of the present, which is also the playing hypersurface in the matrix. The fact that our daily experience takes place in a temporality and that this temporality flows in the direction past-present-future (the arrow of time or temporal vector), brings the proof of the existence of a process of playing and, therefore, a player. This hypersurface therefore slides in the matrix, along the temporal axis, at the speed of light and actualizes each micro instant of the universe as it slides (like a laser

head plays a film on a DVD). Every conscious observer finds himself at the tips of two cones which define what he can and cannot observe, i.e. what he can or cannot be aware of, given the speed of light, which is also that of the playing of the matrix.

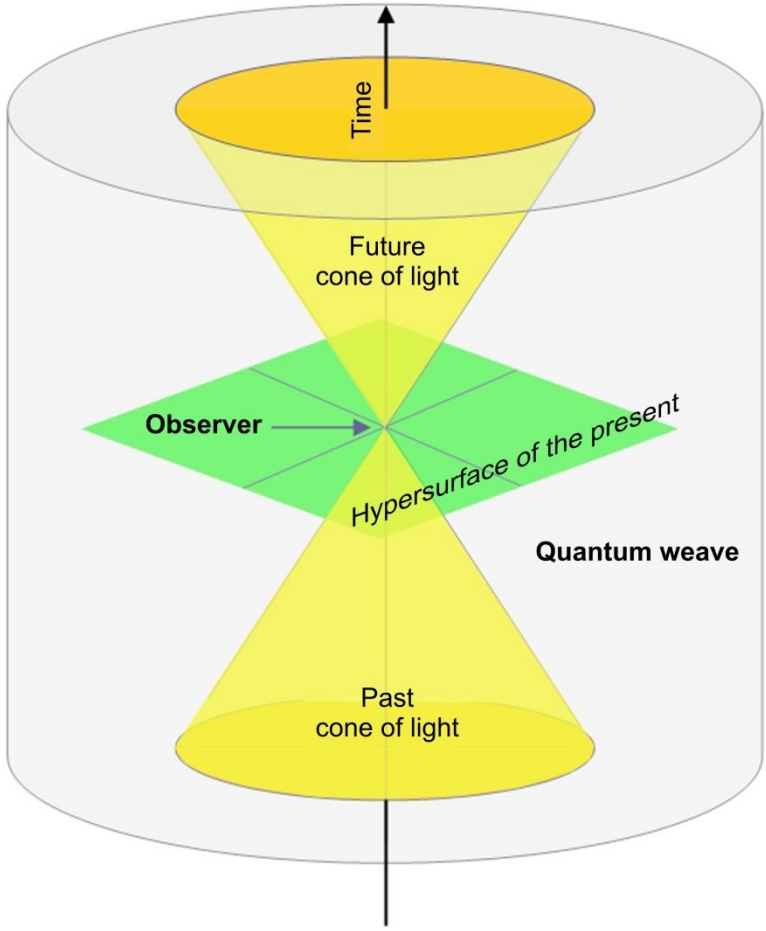

Figure 45: The observer in the quantum weave.

"Below" the observer, the past light cone, "above" the future light cone. For the theory of relativity, time and space are isomorphic, in the sense that the past is equivalent to distance in space. In other words, what can be represented as

temporal "space," duration, is equivalent, at the spatial level, between proximity and distance. The spatially close is also temporally close and the reverse. So there is indeed an isomorphy between space and time and it is for this reason that the isomorphy is represented by a cone: the further the observer looks into the past, the more space he embraces to observe. At a light-second and a half, the observer sees farthest only the Moon. At eight minutes, he will be able to see the sun, at four light years, he will see the star closest to us, *Proxima centauri*. Thirty thousand light-years away, he will see the center of our galaxy, the *Milky Way*. Thirteen billion light-years away, he will see the first galaxies that appeared just after the Big Bang…

Let's imagine a system that sends a computer to the planet Mars, with a parabolic antenna to be able to communicate with the Earth. This computer is programmed in such a way that when it receives information (say "Hello Mars"), coming from the Earth, it immediately transmits, towards the Earth, another information (say "Hello Earth"). Knowing that the path between Earth and Mars is traveled by electromagnetic waves between three and twenty minutes (depending on the distance between the two planets), this gives delays between six and forty minutes, between sending the signal "Hello Mars," from Earth, and the reception of the "Hello Earth" signal on Earth.

For the observer on Earth, who has just sent the information "Hello Mars" and who is aware of the nature of the computer system and its reactions, who knows the program of the computer, the reception of "Hello Earth" information is highly probable. We therefore expect almost certain information, the probability of which is 1. If there is not too much interference, if the computer and the transmission systems are working well, the probability of receiving the information "Hello Earth" is 0.9999. Therefore, the human observer can foresee the arrival of the "Hello Earth" information, it is almost certain information, but

which is still in the future. The human observer, on Earth, can imagine it, he can mentally represent the information "Hello Earth." So, we can say here that there is an isomorphy between the future and space. Because the future, for once, corresponds to the fact that the planet Mars is at a distance of several million kilometers from Earth, which explains the delay.

However, when the terrestrial observer will receive the information "Hello Earth," this information passes into the past. That is to say that as long as he has not received the information, the information is in the future and as soon as he receives this information, it switches to the cone of the past. As long as the information has not passed, the Earth-Mars distance is an isomorphic distance in the future and as soon as the information is received, the Earth-Mars distance becomes isomorphic in the past.

Suppose a supernova explodes, 10,000 light-years away, this happens in a galaxy, the image of which we see, 10,000 years in the past, since light or any other signal takes 10,000 years to reach us on Earth. However, until we receive this light signal, the supernova explosion is an event that is in the future. Unlike the situation described above, with the computer on Mars, here no observer really expects the explosion of a particular supernova in this particular galaxy[92]. However, the distance of 10,000 years-light is isomorphic to the time weave of 10,000 years in the future. As soon as we receive the information "explosion of a supernova," it then switches to the past. The spatial distance of 10,000 light-years will now be isomorphic to the past 10,000 years.

So what we call future are past events, past information, which has not yet happened to us... but it has passed! What we call the "future" is past information that has not yet happened to us. But what about is it from the near future, like, for example, the event: "tomorrow morning I leave for

work." Is it also from the past that has not yet happened? We can answer this question positively: yes, tomorrow is a thing of the past that has not yet happened. That's why it is from the future. This confirms that the day of tomorrow is written in the matrix above the playing surface. For example, the next minute is near you, in the future. The next minute has **already** arrived in the future. Tomorrow has **already** arrived… in the future!

Imagine… You turn the key in the lock of your house, to close the door, and you go for a walk. Halfway through your walk, which lasts an hour, at the end of half an hour, therefore, the "you" who closed the door, turned the key in the lock, is half an hour in the past. However, half an hour into the future, that "you" already exists. There is a "you," in this sort of "past of the future," who is turning the key in the lock of his house to open the door. At the level of the informational matrix, this has happened. It has **already** happened. It is **already** arrived. If you had a special telescope that allowed you to look far into the matrix, you could see yourself doing it[93].

Imagine this thought experiment, which is completely achievable. On Earth we have an individual that we will call the "Earthling" and on Mars, another individual that we will call the "Martian" (he is also a human being, let's not complicate things!). The Earthling lives in a house in the countryside and likes to go for walks.

The Martian lives in his Martian station and also likes to walk, equipped with his space suit, in the middle of the red rocks of Mars. The front door of the two places of residence is surmounted by a video camera which, by means of a powerful radio transmitter, sends from the Earth to Mars the image of the Earthling in closing the door of his house and, from Mars towards the Earth, the image of the Martian closing the door of his station (you never know!)[94] Moreover, the Earthling and the Martian have all the two one watch, the

two watches being, at the start of the experiment, synchronized: they indicate three o'clock p.m.[95]. At the time of this experiment, we will consider the two planets at a distance of thirty light-minutes. To fully understand what is going to happen, look at Fig. 46.

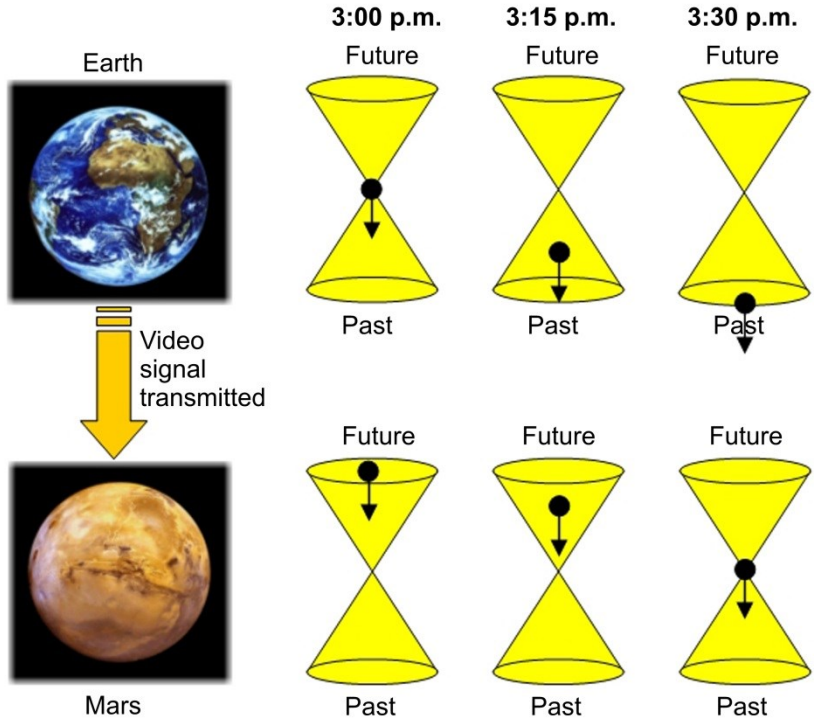

Figure 46: Earthling and Martian experiment.

In the figure, the black dot with an arrow indicates the event, on Earth: "the Earthling closes the door of his house." It is three o'clock. For the Earthling, this event is, of course, in his present, just at the junction between the two cones of light. From three o'clock, the event will slide into his past cone of light, moving further and further away. For the Martian, who looks at his video screen, waiting for the signal coming from the Earth, the event is far away, thirty minutes

away, in his future cone of light. The event approaches him, slides towards his present. At 3:15 p.m., for the Earthling, the event is fifteen minutes away in its cone of the past, while for the Martian, the event is fifteen minutes closer in its cone of the future, it is fifteen minutes of him.

At three thirty minutes, the event is thirty minutes in the Earthling's past, while it becomes a present event for the Martian who sees on his video screen the Earthling closing the door of his house. Of course, this experiment is completely reversible, with the Martian closing the door of his station and the Earthling watching the scene on his video screen thirty minutes later.

This experience, of an event transmitted between two observers, the Earthling and the Martian, shows us that each point of the universe has its own present. On either side of this present (which lasts, in fact, only during a Planck time, i.e. 10^{-44} seconds), the two cones of the informational matrix open: "downwards," the past, the cone of awareness of remembrance, memory and, "upwards," the cone of the unforeseen or planned, predicted, more or less probable, imagined, hoped, desired… Each universe point has its own present, its own past and future cones, but time itself, while flowing everywhere at the rate of 10^{-44} seconds (with respect to the local reference frame), is relative from one point to another in the universe and can give rise to shifts, slowdowns, accelerations, by comparing the clocks of different reference frames.

In the block-matrix, the past of the observer still exists and his future already exists. Past and future are as if predefined, "written," in the great informational matrix. This raises the question of free will.

The question of free will is a false question, because it is an illusion, just like time itself. If we define free will as the ability to make decisions on our own to influence the course of things, the illusion is twofold: 1) we are ignorant of the

multiple causes, imperceptible, too numerous and entangled, which will determine our decision-making and our illusory feeling of free will stems from this ignorance of the causes and we join here the notion of chance as ignorance of the causes which produce such an effect; 2) it is possible to design a computer program that commands a robot: a) to analyze a situation; b) to take a decision *X* by rejecting a decision *Y*; c) to record this decision (choice of *X* and rejection of *Y*) as a free choice. The situation for us humans is no different than that of this robot, which means that our free will, our sense of freedom, is **already** "written" in the block matrix.

At the level of the informational matrix, time does not exist (nor space), because the matrix is in a spatio-temporal non-locality. However, it is the playing of the matrix which gives, to the human consciousnesses that we are, the sensation (and the illusion) of time. Of a linear time, with memories of the past, a present (one should say an immediate past incessantly happening) and an unknown future (although often probable, expected).

From the point of view of a human consciousness, the present does not exist, it is a tipping point between past and future. For our brain, our consciousness, it takes 250 milliseconds for an object to be perceived "in consciousness." This duration is an eternity if we compare it to the speed of playing the matrix which is that of light. "This" that plays the matrix does so every 10^{-44} seconds (Planck time). Playing the Matrix is therefore 2.5×10^{43} (i.e. 2.5 million billion billion billion) times faster than consciousness processes. Suffice to say that we are not close to "perceive" the flow of quantum time!

The past, always from the point of view of a human consciousness, is… memorial information. Starting with the memory of the immediate past which constantly feeds the consciousness. Then, the memory of the more distant past, of

which we know the imprecision and the transformations. The material recordings (books, electronic memories) of the past are also information, but partial in the sense that they do not reconstitute all the richness of the current lived experience in consciousness. The past also concerns the "cone of light," that is to say the electromagnetic information coming from the past of the universe which surrounds us. We are thus one and a half seconds from the Moon, eight minutes from the Sun, between three and twenty-two minutes from Mars, two and a half million years from the Andromeda galaxy… and 13.7 billion years from the Big Bang!

As for the future, it forms a cone symmetrical and opposite to that of the past, but it is unknown and remains unknowable. The reason is the asymmetry of the "arrow of time:" the playing of the information matrix is done in one direction only, which gives the orientation of the arrow of time, from the past to the future. It is for this reason that telescopes can look into the matrix's past and not into its future. By analogy, the DVD is played from the inside of the disc to the outside and not the other way around, so that the film always runs from beginning to end and not the other way around.

The Player

Playing the matrix produces the phenomenal universe… in (at least) one consciousness. But what is this process of "playing?" How is the playing done? We can also ask ourselves: why is playing done? It is necessary to abandon an overly anthropomorphic vision of the thing and also be wary of metaphors, which illustrate but do not explain. The metaphor of the playing of a DVD by a laser head, to represent the playing of the information matrix, finds here, like any metaphor, its limits. Playing the matrix, despite the analogy, is not exactly like the laser that plays the surface of the DVD disc or even the reading of a book by a human being.

The "playing" of the informational ontonomic matrix is something else, because the "Player"[96] of the matrix is quite different, from the metaphorical point of view, from a laser playing head.

What is called the "playing" of the matrix is the very process of actualizing ontonomic potentiality. There is the matrix and there is the actualization of this matrix in a universe. "Consciousness" is part of the actualization, it is intrinsic to it. This joins the Buddhist analysis which makes consciousness and phenomena consubstantial: no consciousness without phenomena and no phenomena without consciousness. When the question of consciousness is badly posed, we find ourselves faced with a false problem.

What plays the matrix cannot belong to or come from the matrix. So it would be something outside the matrix that plays the matrix. But since, outside the matrix, there is nothing but the matrix itself, since everything flows from the matrix, **it would therefore be the matrix which plays itself.** But what do we really mean by "plays itself?" How does this "self-playing" come about? The matrix being information, can information play information?

The phenomenal universe "appears" only at the moment of playing. It is playing that generates the phenomenal universe. If we start from our experience of daily life in the world, at the start, we say "it is my consciousness that plays," a consciousness that rubs shoulders with other consciousnesses that, apparently, play the same book-universe. We thus arrive at the classic so-called "realist" position: a world outside my consciousness and the plurality of consciousnesses. Except that if one realizes a transcendental epoché, this time one arrives at solipsism: there is **only** my consciousness. But this solipsistic consciousness, being itself subject to a transcendental epoché, will refer to a transcendental consciousness. But the latter, also subject to the fire of solipsism, only refers to an

endless interlocking of transcendental consciousnesses. All this brings us to the tetralemma of consciousness, of the ego, to the emptiness of consciousness. **Consciousness is therefore only an extension of the ontonomic expansion in order to be able to create the phenomenal universe by playing the matrix.**

To say that the matrix plays itself is also to say that the matrix "interferes with itself." An expression that resonates strangely with the conclusions of "Young's double-slit" type experiments: the photon "interferes with itself." And the rapprochement, we will see, is not trivial. Indeed, what are phenomena at the quantum level? It is about the interaction of wave systems: waves interact, interfere, with themselves. And even if we consider waves, apparently foreign to each other, interacting with each other (for example, two independent laser beams, two stones thrown simultaneously into a pond), the structure of the matrix as an expansion of a single onton, a single onton deployed in strings, shows us that independence is only apparent and, as the Mādhyamaka says: everything is connected to everything. It always comes back to "the matrix interfering with itself."

The interesting point is that this interference of the matrix with itself is not generated everywhere in the matrix, but on the playing surface, the thickness of an onton, which moves at the speed of light in the matrix. When the Gandavyūha Sūtra speaks to us of One Mind as the Ultimate Reality, it immediately specifies it is not a question of a universal consciousnesses, nor of a transcendental ego, nor even less of a divinity. On the contrary, the sūtra seems to drown this one Mind in Ultimate Reality itself, in phenomena and their emptiness: from a single grain of sand one can know this one Mind.

What the Gandavyūha Sūtra means by this, in a somewhat poetic way, is that this One Mind, this Matrix Player, is disseminated over the playing hypersurface. This is the first

point. The second point is that this unique Mind, this Player, only takes on its existence, is actualized, on the occasion of playing. Like pelagic sharks, which must constantly swim to breathe and live, the Player must constantly play in order to be: it is its very action of playing that gives it its existence.

Basically, it is important to remember, what the Player plays is information. It is therefore a question of binary switches between onton and nihil, nihil and onton. Which means that each passage from "1" to "0" or from "0" to "1," actualizes a very small fraction of the Player, of the unique Mind, of the Ultimate Reality, at the same time as a space-time fraction of universe.

Playing is what actualizes space and time: space, through the three-dimensional holographic translation of the hypersurface, and time, through the sequential nature of playing, as the hypersurface advances into the matrix. Space and time giving everything else: forces, materiality and movement.

To fully understand this "Matrix-Player-Universe " unity, let's take up the logic of ontonomic expansion. The onton unfolds fractally up to the hypermatrix, then, in each matrix of the hypermatrix slides a playing hypersurface. Question: why a playing hypersurface? A simple and pragmatic answer is: given that the spatiotemporal universe exists, this existence justifies that of the playing hypersurface. However, this tautological and trivial answer (which stems from an anthropic principle) hardly advances the answer to the "why." Why does the onton extend further than the matrices? We have to hang up here with the fundamental principle of onton expansion.

The onton, once deployed in matrix, then in hypermatrix, has not finished its expansion. And the playing hypersurface is part of this continued expansion, it is the means. The basic Leibnizian principle to which one must refer is always: "why is there something rather than nothing?" Let us recall that

the Leibnizian principle serves as a framework for the original duality, that which distinguishes onton and nihil. If this principle applies well to the original onton, as well as to the whole universe (and therefore to the multiverse), it thus applies and also to each grain of sand of this universe, to each phenomenon, from the most tenuous to the more cosmic. And, if each grain of universe is an answer to "why is there this grain of universe rather than nothing?," we can also replace "nothing" by another different grain of universe, which gives: "why is there such grain of universe rather than such other grain of universe? or, more simply, "why this and not that?."

Now, for the onton, this question has no meaning, because the onton unfolds under the principle of omnipossibility or omnipotentiality. Everything that is possible, the onton will produce it. The principle of expansion of the onton is therefore not an alternative "why this and not that?" but a "this AND that" statement. The onton unfolds in this AND that, in all the infinite possibilities.

All the possibilities exist, which is explained by the fractal structure of the hypermatrix, which contains an infinity of infinities of universes, the multiverse, which allows the this AND that. The principle of this AND that allows us to partially answer the question of the playing hypersurface: because this AND that, because "everything is possible," because the omnipotentiality of the onton, then, these principles come to justify the existence of a playing surface which actualizes a spatio-temporal universe.

Which undoubtedly brings us to the tetralemma of tetralemmas, because it is at the foundation, at the start of all the other tetralemmas: what plays the matrix cannot be the matrix; what plays the matrix is necessarily outside the matrix; but there is nothing outside the matrix; so, what plays the matrix…

"The Playder exists, does not exist, exists and does not exist, neither exists and nor does not exist."

It is quite possible that for many players of this work, this fundamental tetralemma defining the Player of the informational matrix is intellectually disappointing. They would have preferred a "divine" solution, a "universal consciousness," a "God" like the human consciousness playing this book. But this is not so, and the emptiness of the Player makes perfect sense, because it is the basis of the emptiness discovered for everything else: the emptiness of the phenomenal world, the emptiness of the self, the emptiness of emptiness. It cannot be otherwise.

We know that the most fundamental process of playing, and also the most elementary, consists either in the passage from the onton to the nihil, or in the passage from the nihil to the onton. Which results in the most tenuous of quantum phenomena in a three-dimensional spatio-temporal universe. This minimal phenomenon corresponds to what is called the fluctuation of the quantum vacuum and results in the emergence of "virtual particles," whose lifespan is infinitesimal, before returning to the vacuum.

These minimal phenomena, the fluctuations of the vacuum, correspond well to a minimal consciousness. The phenomenal actualization in a spatio-temporal universe is the extension of the onton which has been deployed in the matrix. This actualization completes this unfolding, by means of a consciousness unfolding, of an increasingly ample and complex consciousness, taking into account the links of consubstantiality between consciousness and phenomena.

In the Gandavyūha Sūtra, as we have seen, what is called the One Mind is neither a universal consciousness, nor a transcendental ego, nor a divinity. The One Mind is, in fact, the very process of playing, considered as a whole. Therefore, the playing hypersurface which actualizes the phenomenal

universe is called the One Mind. From this One Mind, from this playing, emerges the multiplicity of consciousnesses, at different levels: fluctuations of the quantum vacuum, particles, stars, galaxies, but also the various living organisms, the human being and his own consciousness which, all, are endowed with a more or less developed consciousness, using processes of representation, memory and anticipation. All of these levels of consciousness result from the process of playing. This process of playing therefore consists in generating consciousness, on all the multiple levels of complexity of this consciousness. The Player is consciousness, the playing is consciousness. They form a unit: **Player-Playing-Consciousness**.

The question of the nature of the Player therefore comes down to a tetralemma. If the tetralemma does not tell us what the Player is, **it tells us what it is not**. The Player is not an entity, a personality, in this sense, it is not a universal consciousness, it is not a transcendental ego and even less a divinity, God. The Player and the process of playing, just like the phenomena, are consubstantial. Everything works together, they are the three aspects of the same thing, which is in fact the onton, what exists. There is no Player who does not play and there is no playing which does not actualize phenomena. The unit to be considered is: **Player-Playing-Consciousness-Phenomena**.

The Player is disseminated throughout the phenomenal emergence, from the fluctuations of the quantum vacuum, to the universe in its infinite totality, in the form of a "universal" consciousness, in the sense of global (therefore, "universal" does not refer here to an entity, but to the global character of this consciousness). Between these two extremes are the multiple individual consciousnesses of living organisms, including human beings.

The One Mind, this impersonal universal consciousness, can be described using the parable of the reflections of the

Moon. This One Mind is like the Moon reflecting in an infinity of bowls of water. In this metaphor, the Moon is the One Mind and the bowls of water are the infinity of phenomena. The One Mind is in each of them and each of them partakes of the One Mind. Moreover, the Moon has no personality, has no will, it is just there and, all the reflections of the Moon, in the infinity of bowls of water, inherit this impersonality, this "just be there." From the smallest bowl of water, to the largest, they only reflect the Moon. This is how we must understand the One Mind, as universal consciousness and how this One Mind "contains" all the fragmented consciousnesses, embodied or not (the interactions). It contains the human, animal, material, particulate consciousnesses, and those, elementary, of the fluctuations of the quantum vacuum.

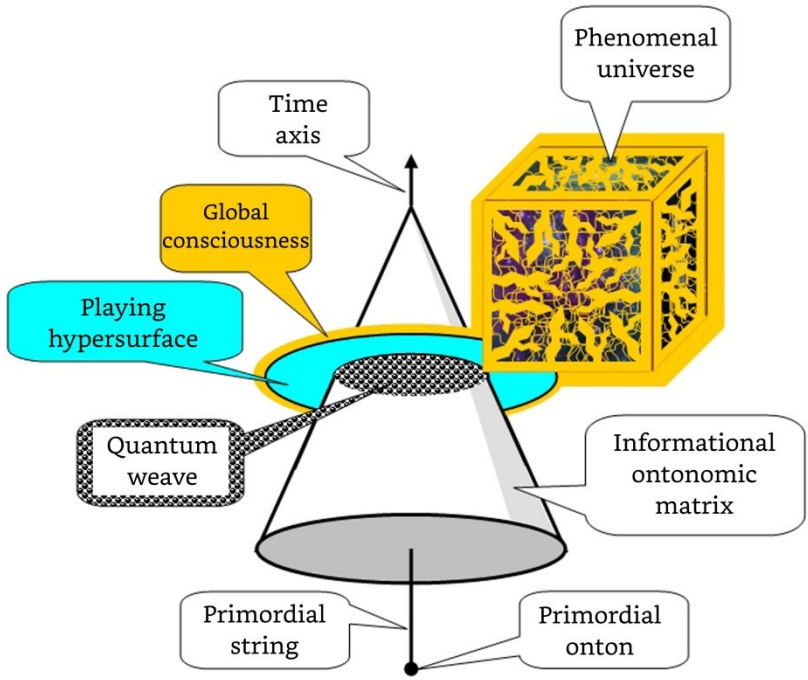

Figure 47: Global informational ontonomic model, including the Player.

There is therefore another unity, that of the fragmentary consciousnesses with the universal Consciousness: **One Mind- Fragmented Consciousnesses**.

In conclusion, we have now arrived at a *with the Player* conception of our informational ontonomic model (see Fig. 47): there is indeed a process of playing the informational ontonomic matrix, therefore a Player and this Player is actualized in the phenomenal processes of interaction and consciousness, in a phenomenal universe. Global consciousness thus "diffuses" from to the fluctuations of the quantum vacuum to the great structures of the universe, passing, among other things, through us, human beings.

Omnipotentiality at work

We know that at the base of the expansion of the onton is the Leibnizian principle of "this AND that," in other words the principle of the omnipotentiality of this expansion: the onton is deployed in all possibilities without any restriction, "EVERYTHING exists." Yet, basically, we only have a "simple" binary informational matrix, made up of "1s" and "0s." Playing this matrix actualizes ontonomic fields (remember that at the level of the quantum substrate of all phenomena are waves), which are the basis of the phenomenal universe. The question is: how can a binary informational matrix generate an ontonomic field of infinite potentialities? How from a simple succession of "1" and "0," in an informational matrix, can an omnipotentiality be generated, actualized? Or, to use our nice metaphor: how can playing a DVD disc produce an infinity of films?

First of all, let's be clear: at the level of a matrix and its universe of actualization, there is no omnipotentiality. A universe is one of the possible universes, that is all. Omnipotentiality resides in fact at the level of the hypermatrix, that is to say of the multiverse, of the possible actualization of an infinity of universes. The onton, in fact, has a multiversal character, due to the hypermatrix.

Thus, there are "multiversal" correspondences between the onton, the multiverse it contains and the multiverse to which it belongs (review the informational ontonomic hypermatrix, Fig. 43). It is these correspondences that create a field of potentialities. An onton contains a multiverse and, itself, is contained in a multiverse. In fact, we do not have a univocal ontonomic actualization. The multiverse is always there, permanently. And what is called the matrix is an actualization within the framework of links with the near, proximal, hierarchically proximal universes, in the multiversal matrix, the hypermatrix.

We are, at the level of our daily experience, in our small life as human beings, confronted with a certain contradiction: at the same time we live in a standardized, determined universe, with laws (causal, natural, and social) which is therefore limited in possibilities and, at the same time this universe is embedded in a fractal multiverse offering, for its part, an omnipotentiality of universes, all different (from more or less parallel to totally and infinitely different).

In other words, why, at a certain level of actualization, are there laws, a determinism? How do this determinism and these causal, natural and social laws appear, starting from the omnipotentiality of the multimatrix? Because, after all, everything being possible, why this possible one and not another and above all, why not chaos? How is it that, on the one hand, we live in a standardized universe, when basically everything is possible?

The answer to these questions, to this fundamental paradox between omnipotentiality and standardized universe, lies in the fact that the process of playing the matrix is not limited to the single matrix actualizing our universe. It is that playing itself is open to an omnipotentiality (which is understandable, since there is

unity between **Hypermatrix-Playing-Player-consciousnesses**).

Basically, there is a consciousness condensation, the consciousness condenses on one of the versions of universe in the multiverse. Each version of universe being normalized (the natural laws of interaction). The normalization of the universes is a kind of "simplification," of logical unity, of good form, which allows actualization. The causal, natural and social laws are the modalities of actualization of a universe and the consciousness(es) of this universe is(are) linked to these modalities. There is even a new unit there: **Universe-Laws-Consciousness**.

Consciousness is the actualization of the field of ontonomic potentialities. This actualization is done, in the first place, layer by layer of playing in M_0 (the matrix at the base of our universe of reference). However, for the consciousness, there are fundamentally possibilities, a potentiality, of "leaps" in neighboring matrices, corresponding to quasi-parallel universes. It follows that, *a priori*, the leaps are imperceptible (who would notice that a tiny atom or molecule has changed in his familiar universe?). One can therefore consider spontaneous fluctuations of the process of playing-consciousness between the different universes of levels close to -1, -2 … or +1, +2 … (quantum vacuum fluctuations demonstrate such fluctuation of consciousness between parallel universes). So, what is called "consciousness," at the multimatrix level, are playing points that fluctuate between close matrices.

Starting from the logical description of the informational ontonomic matrix, we have the onton, which is simply opposed to the nihil, the nothing of nothing, the *Śūnyatiśūnya*. So, in this Leibnizian dialectic, the onton appears. This primordial onton contains the multiverse, it is a potentiality. This onton unfolds in strings and loops, forming an informational network.

The onton unfolds in a matrix, so there is an order, like the meshes of a net, of a network and, at the crossing of each mesh there is an onton (see the metaphor of Indra's Net). However, things do not stop there, because we are in an infinitely multidimensional Hilbert space. Thus, the onton itself contains a matrix. A matrix whose ontons themselves contain a matrix, whose ontons themselves contain a matrix and so on, an endless regression. This matrix, that of our universe, being itself contained in an onton, which belongs to a matrix which, itself is contained in an onton and so on, an endless progression. Our matrix, by the playing of which our universe is generated, is therefore between two infinite fractal expansions. And it is these expansions, in the form of interlocking universes into each other, that form the multiverse. **And when we speak of "changing universe," we are talking about one of these universes, the hypermatrix formed from the infinite set of universe-matrices.**

So when we initially said that "the primordial onton contains the multiverse," it was a way of speaking. There is, strictly speaking, no primordial onton. In the multiverse, there is no start, no finish, no center, no periphery. We do not know "what contains what."

We must not make universe anthropocentrism: just as the Earth is not at the center of the universe, our universe is not at the center of the hypermatrix, this one having no center.

Each matrix-universe (abbreviation of "matrix that actualizes a universe") is "read." We have here a very important concept, that of "reading the matrix." This playing is an "awakening of consciousness," that is to say the work of a consciousness. It is a consciousness that is "universal," in the sense that it encompasses the whole universe. But, and following the same model of nesting of the matrices, this universal consciousness contains consciousnesses and it is itself contained in a consciousness of superior degree and so on[97]. This fractal nesting of consciousnesses is the same

thing as the fractal nesting of matrices at the base of the multiverse.

Fluctuations of consciousness between matrices, that is to say, concretely, universe changes, are therefore not the exception, but the rule. Consciousness constantly leaps from one parallel universe to another, at a very rapid pace. These parallel universes, very close to each other in the hypermatrix, are very little different, so these leaps are practically imperceptible for a human consciousness. The incessant leaps, these matrix fluctuations are, by analogy, like Brownian movements which agitate molecules, or like the vibration of atoms. Our individual human consciousness fluctuates similarly between different parallel universes, which must necessarily lead us to revisit the question of the universe change.

Since universe changes are the rule, that is what happens continuously in the hypermatrix, the idea of "universe leap" is not therefore, in itself, something that is so extraordinary. Also, the question of "universe change" does not concern the possibility of such an action (since it exists, occurs, already), but of its control and its extent. What we want is not to content ourselves with a "tiny" leap, in one or the other of the multiple parallel and near universes, from the informational point of view, in the hypermatrix. But what we want is a leap from a distance, into a universe that is no longer parallel, but sufficiently different to be able to interest our desire for change, for the transformation of our lives. Then, what we want is not an automatic, involuntary leap, but what we want is a leap that we could trigger, starting from our desire. Finally, what we want is not a random leap, into an unknown universe, but what we want is a controlled leap, into a universe (we should rather say into a zone of the hypermatrix comprising a swarm of parallel universes) which responds to our expectations.

To change universe, to join a different universe, a universe as we dream it and to be able to carry out this matrix leap, it is what we are going to see, finally, in the last section of this chapter.

The matrix leap technique

The scientific study of the infinitely large, or the infinitely small, fails to give us a satisfactory explanation of the universe in which we live. Whether it is the theory of relativity or quantum mechanics, these beautiful theories will always have their limits. Because, how can one pretend to study the universe... while being embedded in this universe? How can a razor cut itself? A tongue taste itself? How do you get to your own funeral? We are like fish in their bowl, going around in circles, trying to understand the nature of the bowl and the water it contains. Only coming out of the bowl, a view outside the universe system, could give us the true understanding of the universe itself and its meaning.

We live oppressed between frustrations and desires, satisfactions and sufferings. We are caught in the net of cause and effect, conditioned co-production! We are also caught in the net of our conceptions concerning the universe, the ego, life, religion... We are caught in the metaphysical net of speculations and misconceptions. We are still caught in the net of our emotions, our deepest desires and all our small and big beliefs. **In a word, we are caught in the net of our illusions.** The water in the bowl is not water, it is a thick molasses in which the little fishes that we are, are stuck and swim with difficulty.

Stuck in a universe of causes and effects, for things to change, we generally have to exert intense activity, accomplish innumerable efforts. And all this to lead us, more often than not, to very poor results, if results there are! Our possibilities of changing our universe are thus necessarily limited, because we come up against the inertia of this

universe, a reflection of the underlying informational matrix of which it is the actualization. We are also confronted with a multitude of wills contrary to ours. There are thousands, millions, billions of us all wanting the same teddy bear. The others are far from meeting your expectations, more often than not they thwart them. They constantly put a spoke in our wheels, thwart our projects, annihilate our dreams and, conversely, we often have to bend to their will, those others, who then become social tyrants.

As we explained to you in the introduction, if we cannot practically change our universe… We can change universe! Go look somewhere else! And that is what you are going to learn to do.

Joining this elsewhere is all the more feasible as we are, ultimately, in an ontonomic omnipotentiality: an infinity of different universes are accessible to us, are a few quanta away from us, as long as we know the right technique.

For each possibility there is a universe, so nothing limits the possibility of things. And it happens, every day, it must have even happened to you without you even realizing it. Whenever a major change occurs, such as a revolution, a "miracle," a "magic," people usually think that it is the universe that has changed. They do not realize that a leap has happened to another universe. No doubt someone, or a group of people, ardently longed for this change, and then the leap happened. If you really want it, this leap into another universe could well be your doing.

Another obvious sign of matrix leaping is creativity. A new idea suddenly appears, it emerges without you expecting it. This new idea will then lead to decision-making, achievements, a different approach to the world, to others. And, after some time, you will realize that your life has changed, that your whole universe has been transformed. A matrix jump, into another universe, has occurred. Initially, as a very small new thought, which has grown, matured and

found the right soil to apply concretely in your life. **Creative thought and intelligence are often also the sign of a matrix leap into another universe.**

We have explained it well: the matrix forms a "block," the past, just like the future, are already written there. But never mind, we are not only in a "block-universe," we are in a multiverse: multiple blocks are accessible to us, all we have to do is change block! For this, there is no need to deploy energy, whether physical or mental. Because, permanently, leaps occur in the hypermatrix, permanently the consciousness, our consciousness, fluctuates from one parallel universe to another, like a vibration of being. As well the universe change consists easily in surfing on these spontaneous matrix fluctuations, in extending them, controlling them, triggering them at will. And to achieve this, you must follow a number of preparatory steps that we will explain to you in detail.

Warning: you must take your time during these preparatory steps, in order to clear your consciousness and develop an active tetralemma, it may take several months of meditation before you can move on to the last step: the use of the active tetralemma. Here, haste will only lead you to trouble of the mind and more attachment to this universe.

Prepare your consciousness

The leap is very difficult to control as long as one remains in reference with a consistent ego, which believes in its existence, which believes in the world out of consciousness and in the embodiment of consciousness, which believes in the multiplicity of consciousnesses, which believes in a universal, divine ego, which believes in various superstitions, and so on… This consistent ego and stuck in its phenomenal conceptions, has little chance of reaching the Ish[98] consciousness. That is, to reach one of the nodes of the matrix. The self-conscious ego is as if hypnotized, fascinated, by the passage of each layer of matrix playing, which makes

it believe in a universe, to which it clings. The ego thus remains "stuck" in front of this beautiful spectacle, like the viewer in front of his movie.

The ego is captivated by a magnificent documentary: him in his body full of sensations, the universe around him, the other bodies-egos, the landscapes, the mountains, the stars, the galaxies, the universe as a whole and its duration. Because the spectacle lasts, lasts, lasts… changing constantly to attract the consciousness, to fascinate it more. Not only is the ego in front of the movie of the universe, but he is also watching the ads!

The ego always comes back to it, like those moths fascinated by the light of a street lamp: and its emotions, and its desires, and its beliefs… In such a stuck situation, getting out of it, leaping into another universe, a remote universe, is more than difficult, or even impossible. It is therefore necessary to succeed in detaching the ego from the universe of reference, then detaching the self from the self, the me from the me, the ego from the ego. It is a question of succeeding in recollecting oneself, in a way, through the practice of meditation, recollecting oneself, condensing oneself psychically on a matrix node. This matrix node, an onton, contains the multiverse, therefore other, parallel, emerging universes.

This condensation can be achieved by one of the meditative practices explained in the first chapter: condensation on the mantra, on the breath, on the void… it does not matter which way, because all the ways lead to the onton. What matters is the right inner attitude: letting go, detachment, condensation. In this chapter, we offer the reader a new technique, directly derived from the teachings of Prajñāpāramitā: condensation on the tetralemma. In the first chapter, we saw how to launch a formula from the *Ish*, here we will see how to formulate the tetralemma and how to use it, always from the *Ish*.

The condensation will then bear on the intuitive dimension of the tetralemma. The goal of the tetralemma is to smash, completely smash the representations, the reasoning, the perceptions, the desires, the emotions, the beliefs, in a word: the ego. The ego leaves the ego, it abandons it. From there, in an automatic way, occurs the condensation on an onton, from which the leap in another matrix, therefore another universe, can be realized. Consciousness of the ego changes universe of reference and begins to play another informational matrix.

To prepare your consciousness for this matrix leap, we recommend that you read and read again this present work several times, in order to fully immerse yourself in it. Desires, emotions, just like beliefs, are an impediment to changing universe. It is therefore important to take some distance from all this. It is important to understand and design well in which multiverse you are, we are. We are not in a universe created by a divine being. We are not in a universe where divine scenarios unfold, where destinies unfold and so on. You must understand that we are in a very… mechanical multiverse, in any case impersonal, which, in a way, does not care about your little embodied personal consciousness and your tiny worries. If you want to believe in Santa Claus, feel free! But do not expect to change universe too much with such a passport in your pocket.

Both Nāgārjuna's analyzes and quantum experiments all contribute to situating us in a universe of undecidability, which leads us to conceive of the emptiness of all things. The phenomenal world is empty, a cosmic illusion! All phenomena are co-produced and conditioned, they have no reality in themselves, but by other phenomena, which annihilates the very meaning of the concept of phenomenon.

We generally cling strongly, since childhood, to our ego, to our consciousness. However, this consciousness of the ego turns out to be itself very inconsistent, because it is itself

interdependent with phenomena: all consciousness is consciousness of phenomena and all phenomena exist only in a consciousness which conceives it. To deepen this, practice the two mental analyzes that allow you to annihilate the ego: the phenomenological reduction (the transcendental epoché) by reducing all phenomena to the contents of consciousness; the reduction to emptiness by withdrawing its phenomenological nourishment from consciousness to see what is left… Nothing!

Beyond your personal thinking and analyses, you can meditate on one or the other of the tetralemmas of undecidability below:

“Neither phenomenon,

nor non-phenomenon,

neither phenomenon and non-phenomenon,

neither nor phenomenon, nor nor non-phenomenon.

“Nor outside world,

nor non-outside world,

neither external world and non-external world,

neither nor external world, nor nor non-external world”.

“Neither body,

nor non-body,

neither body and non-body,

neither nor body, nor nor non-body”.

“Neither consciousness,

nor non-consciousness,

neither consciousness and non-consciousness,

neither nor consciousness, nor nor non-consciousness”.

“Neither self,

nor non-self,

neither self and non-self,

neither nor self, nor nor non-self”.

Also be sure to re-read (in the section on “Emptiness of Emptiness”) the beautiful abridged text of the Prajñāpāramitā. And meditate on the tetralemma of renouncing the fruits of one’s actions: doing what needs to be done in the present moment, while remaining inwardly in true detachment, not renouncing action, but renouncing the results of action, give up desire.

“Nor renunciation,

nor non-renunciation,

neither renunciation and nor renunciation,

neither renunciation, nor nor non-renunciation.”

Now, let’s tackle the difficult question of beliefs. Careful re-reading of the section on the “Brahman’s net” is necessary here. You must analyze precisely what, for you, makes belief, analyze your personal conceptions of the universe, of eternity, of a creator God or of multiple divinities. You must analyze your conceptions of the beyond of life, of life itself, of the incarnation of consciousness in a body and the value of this body. Analyze your conceptions of the soul, of the spirit, even of the spirits.

From all these analyses, you must be able to question most of your beliefs, which you must internally get rid of.

Warning! We well say "internally." Because if you do it "outwardly," you will only scratch the veneer of your beliefs and, moreover, in many social situations you risk shocking and suffering the consequences of the display of your new conceptions or non-conceptions. Purifying yourself of your beliefs in order to be able to change your universe does not consist in acting in the world by shaking up your life and the world, because then, the opposite will happen, you will be more and more attached to this universe.

Useless (and strongly discouraged) therefore to divorce, sell your house and give the money to the poor; useless and harmful to suddenly become an apostate, to announce to your family, to your loved ones that you are dropping the religion hitherto shared with them; useless and also harmful to flaunt in front of your friends, your co-workers, the conceptions of Mādhyamaka, of Prajñāpāramitā, to speak of emptiness and of your decision to "change universe." Because, not only such actions will inevitably have unfortunate consequences for you, in this universe, but moreover, they show that you have finally understood nothing of the true emptiness, the true detachment of this universe. **True detachment is an inner transformation, without doing anything on the outside.** This is an essential key to be able to achieve the universe leap.

To purify yourself and neutralize your beliefs, you can use appropriate tetralemmas such as, positively:

"God exists,

God does not exist,

God exists and God does not exist,

neither God exists, nor God does not exist."

In negative (your choice):

"Neither God exists,

neither God does not exist,

neither God exists and God does not exist,

neither nor God exists, nor nor God does not exist."

Adapt this tetralemma according to your conceptions, replacing "God" with what characterizes such and such a belief. For example: "path" (if you think there is a path to follow to achieve something); "heaven," "Nirvāna" or "hell" if you believe in it; "spirits," "entities," "angels," "demons" or other ("extraterrestrials!") if you believe in it; "reincarnation" if it is your conviction; "doctrine," "precepts" if you believe in rules of a religious nature; "master," "guru," "Messiah" or any other personage, entity, prophet… if such are your beliefs; "meditation," if you think that it can have effects on this world or yourself; "magic," "miracle," if you believe in it; and so on… Analyze all these beliefs well and burn them all in the fire of the tetralemmas, but never forget that the Mādhyamaka is not opposed to any religion, because its teaching is beyond all religions. So, apart from your personal work of purifying your beliefs, if it is appropriate and necessary, you must "play" your religion among your fellows and let nothing be seen. **The Bodhisattva, the one who has decided to follow the path of the Buddha, becomes a perfect actor in the world of illusion, he becomes illusion himself!**[99]

Once you have accomplished the sometimes painful act of letting go of your beliefs, we suggest refreshing your mind with matrix meditations, which will help to direct your consciousness towards other universes. Become like the children who look at the illustrations in a storybook and feel like they can enter the image and the world of the story. Find this freshness of childhood during these meditations.

Meditation on Indra's Net

For this meditation, mentally represent Indra's net in the form of an infinite three-dimensional matrix, traversed by the cords of an immense intersecting net. At each crossing of cords there is a knot and, attached to each knot, a magnificent mirror ball in which all the other mirror balls are reflected. Look carefully at one of these reflections, that of a mirror ball and see on its surface the reflection of all the other mirror balls. Choose one of these reflected mirror balls and look carefully at its surface, you will see the reflection of all the other mirror balls. Choose one of them and so on… Have fun going as far as possible, deep into the matrix, meditating as long as possible on this marvelous Indra's net!

Meditation on Hotel Hilbert

For this meditation, mentally picture the infinitely multidimensional Hotel Hilbert. But, instead of travelers, you will place in each room an infinite universe, represented as a cosmic space, a black sky filled with stars and infinite galaxies. When you open the door of a room in this hotel, it is like opening that of a spaceship, jumping into the great cosmic void guaranteed! Then, you will begin to visit this Hotel Hilbert: you go to the first bedroom (well, stay on the threshold, do not fall into intergalactic space!) and you contemplate for a moment the universe that is there. Then you do the same for another bedroom, then another and so on… You thus go through the first corridor for a while, then, between two bedroom doors, you cross a new door which leads you into another corridor and you resume a few room visits, until you decide to go to another corridor, between two bedroom doors and so on… Again, have fun going as far as possible, deep into the matrix, by meditating as long as possible on this marvelous Hotel Hilbert!

Meditation on playing

For this meditation stand in front of a beautiful and spacious landscape and mentally picture the process of

playing as it is taking place to actualize the reality of this universe. Imagine that at each micro-moment there is a motionless snapshot of this landscape and of the entire universe that surrounds it endlessly, like a cosmic freeze frame. Then, scroll image by image. Imagine that this landscape, but also the people, the animals that are there and yourselves, are only elements of a 3D image, which changes from moment to moment. A bird flies? An image where it is one meter from the tree from which it jumped; an image where it is two meters away; an image at three meters; an image where it lands on the branch of another tree; and so on… Have fun doing this exercise, feeling the images follow one another, getting out of the illusion of a continuum world. On the contrary, split it into successive 3D images. Your wife (or husband) comes to ask you, with a hint of nervousness, what are you doing? Look at the image by image, this scene which is announced will then become light and laughable!

Meditation on onton

For this meditation, mentally picture the primordial onton and unfold it as a string in the matrix. Imagine this string coming from the past and going through your hand. Then that string slides into the future, months into years into the future, and it loops back down to your present with a slight spatial shift of a few meters that takes it through a tree near you. The string then goes back into the past, a few hours, weeks, months or years and it makes a loop again, to go back to your present. There, its discrepancy causes it to go back into your hand or into something else and so on… Have fun making dozens, hundreds of round trips with the string, between past and future, to make it actualize phenomenal points all around you and within you. Then you will begin to have a vision of the informational ontonomic matrix!

Learn to build an active tetralemma

In the first chapter, we proposed a very neutral "formula" of *Ish*, to mentally launch into the *Ish* state, that is to say a state

of inner detachment as advanced as possible. This formula consisted of a simple descriptive affirmation of the style: "This happens," "Something is like this." Simply affirming and describing, as if it had already happened, but without asking or wishing for anything and, above all, without considering any action. The formula of *Ish* should not be too long, around two or three words.

In this present work, you will learn how to use another method, undoubtedly more effective for the universe change, it is about the tetralemma. There again, still in the meditative state called *Ish*, it is no longer a simple formula that you will mentally launch, but a tetralemma related to your desire to change universe. The tetralemma is used and is effective because, as we have seen throughout this work, all of Ultimate Reality depends on the undecidability of the tetralemma. If necessary, read again the section about the "Nagarjunian tetralemmas."

The construction of the tetralemma starts from your will to change your current situation, to see a change, a transformation, occur. But at the same time, you have to give up the results of whatever action you take to achieve that change. Any attachment to the fruits of the action is attachment to the present universe, which prevents the universe change, except the quantum leaps in the close parallel universes which, therefore, do not change anything in your situation. To be able to make a leap in magnitude, that is, to a universe far enough away in the hypermatrix to be different from your original universe, you must mentally detach yourself from the universe you are currently in (in fact, detaching yourself from the area of parallel universes in which you find yourself). There is therefore a form of paradox, in wanting to change universe, but at the same time in wanting to implement actions in this present universe to change your situation. Also, the tetralemma, which is itself a paradox, responds perfectly to this situation, because it will act as a counter-paradox.

In the first chapter, we simply asked you to repeat a very neutral formula, in the most detached state of mind possible. With the tetralemma method, it is the tetralemma itself that will be both the neutral formula, but also the action of interior detachment. For this, the tetralemma acts by neutralizing itself. As a reminder, and taking the tetralemma of the self as an example, the structure of a tetralemma is made up of four parts:

1. Affirmation: **"The self exists."**
2. Negation: **"The self does not exist."**
3. Affirmation of affirmation and negation: **"The self exists and the self does not exist."**
4. Negation of affirmation and negation: **"Neither the self exists, nor the self does not exist."**

The tetralemma posits an affirmation, then, first neutralization, it posits a negation which opposes the preceding affirmation. But, as if that were not enough, the tetralemma then affirms that affirmation and negation go together, a new neutralization. Finally, a final neutralization is performed by positing the negation, the opposite, of the preceding affirmation, by positing the negation of the affirmation and of the negation at the same time. Thus, starting from a simple affirmation, the initial affirmation, the tetralemma will accomplish three neutralizations. This is where resides all the power of detachment and transformation of this mental tool that is the tetralemma.

We have just seen the positive tetralemma, but, in the tetralemma in its negative form, the principle of the three neutralizations also appears. Simply, at the start, the initial affirmation undergoes a first neutralization by negation. Then, it is therefore three neutralizations of neutralization that operate. Hence the very great strength of negative tetralemmas over positive tetralemmas.

1. Negation of the affirmation: **“Neither the self exists.”**
2. Negation of the Negation: **“Neither the self exists.”**
3. Negation of the affirmation of the affirmation and of the negation: **“Neither the self exists and the self does not exist.”**
4. Negation of the negation of the affirmation and the negation: **“Neither nor the self exists, nor nor the self does not exist.”**

Now, the whole question is to be able to define in a correct way the initial affirmation, starting from what is expressed by your will to change. But, a preliminary is essential, as for the objectives that you pursue by wanting to “change universe:” never forget that, whatever the universe in which you are going to switch, this universe will always be a “phenomenal conditioned co-production.” This means, not only that you will obviously find yourself in a phenomenal universe, of phenomena existing in a consciousness and of a consciousness of phenomena, but moreover, all these phenomena, including your own consciousness, are co-produced (i.e. depend on other phenomena) and conditioned (i.e. subject to the law of cause and effect). We are therefore still in a universe of dependence, of reciprocity, of interdependence. This point is very important, because you cannot do anything if you want to change universe, at the risk of finding yourself in a hellish universe for you. The versions of hell are infinitely multiple! There are bedrooms in the Hotel Hilbert that are best avoided.

For the Mādhyamaka, morality has nothing romantic. Buddhism does not posit the morality of desires and actions on the basis of emotions, good feelings. It is in no way a morality of the heart. Which is normal, since morality itself is a phenomenon inscribed in the middle of other phenomena and is, in that, the same illusion. Hence, if Buddhism is philosophically amoral, you will never see it advocating or inciting immorality. Why? In an illusory

universe, we could very well do what we want, everything we want? And moreover if it is a question of "universe change" why not consider an immoral universe? A universe where we would have all the powers to carry out murders, rapes, thefts, destruction and other amusements of the wicked?

The reason, for Mādhyamaka, is very simple and mechanical, not at all "moral:" in a phenomenal conditioned co-production, everything you do, sooner or later, will fall on you, it is unmistakable. We always see the effects already in this present universe: the bad guys always end up losing. It can sometimes take time, a long time, but it always happens. A universe where you would have all the powers without counterpart, without suffering in return the effects of your acts of power, such a universe cannot exist. And this is absolutely not in contradiction with the affirmation that "everything exists," that "this AND that". Because, of course, everything exists, but everything exists in the form of a phenomenal conditioned co-production. So there will always be backlash to your desires and actions. So, be very careful in what you are going to define as the basic assertion of your tetralemma.

In fact, the will to change the universe should always have a "noble" character. By this nobility we mean a will that goes in the direction of harmony, compassion, respect for phenomena, order, self-forgetfulness, affective and generous openness towards other consciousnesses. Otherwise, the mechanical laws of phenomenal conditioned co-production will, sooner or later, turn against you.

Let's imagine that your desire to change the universe is based on the desire to see someone die. First, the power of such harmful desire, in the person who maintains it, leads to such an attachment to the present universe that there is little chance that he will ever manage to change universe. But let's suppose that the person is smart enough to practice a

sufficiently neutralizing tetralemma and to allow him to change universe. He will find himself in a universe where, that's it, his will has come true (murder). Do you think things will end there? No way! In this new universe, inevitably phenomenally co-produced and conditioned, the other consciousnesses are there, with their own will and the acts of the person will end up being turned against him. And even (let's do a bit of science fiction), if you leap into a universe where there are some sort of "humanoid robots," of flesh and electronics, sooner or later, depending on the level of "consciousness" and "sensitivity"" of these robots, murders, rapes, abuse, towards these robots, will turn against their authors (after all, in our universe, even animals are generally defended and protected from the cruelty or the moral irresponsibility of men). So, be careful!

Another point to consider in the form of your basic affirmation is that it is too simplistic, obvious, abrupt. For example: "winning the lottery." It is already such a crude desire that it will inevitably attach you to this present universe. Moreover, it is a desire far too circumscribed, far too closed in terms of the generation of causes and effects that the chances of falling on a universe in which this is realized are more than slim. Imagine already that, in this present universe, the chances of winning a fortune in the lottery are tiny (one chance in several million, for example), not only will it be the same in another universe, but moreover, such a universe, characterized by such an event is also subject to a very low probability, so to speak (a chance on… infinity). Also, it is preferable to formulate your desire for wealth in a broader way, by bringing into play a bundle of phenomena, events, rather than just one, winning the lottery. Aim preferably for goals that automatically involve the achievement of other beneficial and altruistic goals. The affirmation "to be rich" is already better, because it leaves the door open to all the various and varied means of becoming rich. If you say "have the means," it is even more neutral. But

if in addition, you immediately aim for an altruistic use of this wealth, for example with "to make happy" or "house for my family," then you will have a good quality basic affirmation for an effective tetralemma, which could well to come true.

Thus, between your initial will, which is generally complex, and the basic affirmation of the tetralemma, there is a whole process of neutralization, possibly moral purification and simplification. Simplification in form too. We advise you to adopt the style of Chinese ideograms. For example, instead of "love a woman," "love a man," contract "love woman," "love man" or the reverse "woman love," "man love." "Having work" becomes "work." "Having a house for my family" becomes "house family" or the reverse "family house."

Then, from this basic assertion, construct the positive tetralemma as well (take the last example with "house family"):

"House Family."

"Not house family."

"House family and not house family."

"Neither house family, *nor* not house family."

The negative tetralemma takes this form:

"Nor house family."

"Nor not house family."

"Neither house family nor house family."

"Neither nor house family, *neither nor* not house family."

Follow this model for each tetralemma you will make. Use the tetralemma following the method described in the next section.

Use active tetralemma

In the first chapter of this work, we propose a rather summary technique, intended for the beginners, to try to produce the universe change, starting from a bare and simple formula. The tetralemma is ultimately four formulas that neutralize each other to ensure better detachment from this universe.

To be able to use the tetralemma correctly you must be in a state of deep meditation and touch the *Ish* consciousness. For everything concerning the practice of meditation, *Ish*, the preliminary work of overcoming bodily tensions, please refer to the first chapter. Once Ish consciousness is reached, probably after several weeks or months of daily meditation practice, you will be able to use your tetralemma. For this, please refer to Fig. 48.

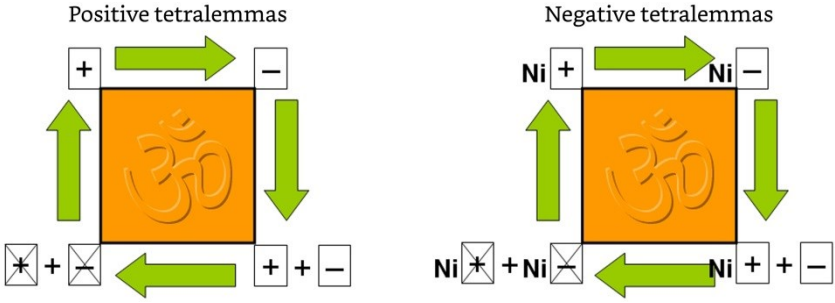

Figure 48: Diagram of tetralemmas.

The diagram is double and concerns, on the left, the positive tetralemmas and, on the right, the negative tetralemmas. In the center, a square, which is quite normal, since the tetralemma (as its name indicates, *tetra* means four in Greek) comprises four "formulas," elements. For a reason that is both symbolic and above all aesthetic, we have placed the sound "Ôm" (ॐ) in Sanskrit characters in the center of this square. This sound or mantra "Om" or "Aum"

(pronounced “a-oo-m”) represents the fundamental vibration of the universe, from which it would have taken its expansion and its form. For us, it is about unfolding the onton. However, you may or may not use this graphic symbol in your visualization of the tetralemma, it is not so important. If it can allow you some mental condensation, then use it. If you achieve enough mental condensation without it, do not use it. But do not forget that, from the point of view of the information matrix, all of this is secondary.

Then, at the four corners of these squares are placed the four formulas that make up a tetralemma. The “+” represents the positive formula; the “–” the negation of the first formula; the “+” + “–” the association of the two formulas by the word “and”; finally, the negation of the two associated formulas, symbolized by the fact that “+” and “–” are crossed out. In the negative version of the tetralemma, the same formulas are repeated, but this time introduced by the negation “neither/nor.” To make things clear to you, let’s take, as an example, the tetralemma on the affirmation “house family.” In positive:

(“+”) “House Family.”

(“–”) “Not house family.”

(“+” + “–”) “House family and not house family.”

(neither “+” + nor “–”) “Neither house family, *nor* not house family.”

In negative:

(neither "+") "Nor house family."

(neither "-") "Nor not house family."

(neither "+" + "–") "Neither house family nor house family."

(neither nor "+" + neither nor "–") "Neither *nor* house family, neither *nor* not house family."

Before using the tetralemma you created, you will make, draw, and color your own representation of the tetralemma. You can give it a "mandala" look, with spiritual symbolic decorations and mark the four formulas on it, at the four corners (rather, leave four bubbles empty, so that you can stick four post-it on them and change the tetralemma, occasionally, without having to redo the whole thing.) The main thing is probably to keep the quadratic form as a base, but it is up to you to inscribe it in one or more circles or to draw whatever you want inside. However, at the risk of distracting you, the simplest and stripped figure is undoubtedly the easiest to use, at least to start the practice. Thereafter, you can do without any visual support.

The use of the active tetralemma, capable in the long term of producing a universe change, is done as follows: you begin by meditating until you reach the *Ish* state of deep meditation. Then, you open your eyes to look at the tetralemma represented in front of you, which you will have hung on the wall, for example, at eye level. You look at each of the four angles in turn and you gently read the formula that corresponds to it and thus turn around the square.

After a while, when you feel well visually imbued with the tetralemma, you will begin to close your eyes and mentally visualize the rotation on an imaginary square, while continuing to recite the formulas in a low voice.

Thereafter, you will gradually turn off your voice and repeat the formulas simply in thought, while continuing to

visualize, of course. So you turn slowly, quietly, clockwise (if it suits you better, you can completely invert the figure and turn in the opposite direction, which will require reconstructing the tetralemma with the elements in the reversed order). The essential is the association between the mental repetition of the verbal elements of the tetralemma and the rotating visualization on the four angles of the square. Because, over the meditations, with the deepening of the practice, you will gradually let the verbal aspect of the tetralemma dissolve and remain simply on the spin. Your mind will slowly spin, like a prayer wheel, from one element of the tetralemma to the next. Then, the verbal aspect, without really disappearing, will become more and more subtle, like an unconscious thought, which will reinforce its active force to bring about, perhaps, the universe change.

Use a tetralemma while the universe change occurs. It can take days, weeks, but also months or years. This will depend on many factors that were detailed in the first chapter. You can refer to it (in the "Until it does not work" section). Be attentive, do not forget that a universe change can manifest itself simply by a new creative idea which emerges in your consciousness and which can be the starting point of a beneficial realization for you.

Do not change tetralemma until you have gotten a result with the first one (or have decided, after some thought, that the universe you want is not a relevant goal for you). Changing tetralemmas or using two or more will only disturb your consciousness and lose the effectiveness of all those tetralemmas.

Also remember to relax from time to time, even regularly, with the meditations on the matrix, meditations that you can do while walking, as well as while sitting. Alternating between these meditations and the one on the tetralemma seems a good idea, because the right representation that your consciousness has of the universe, of reality, in fact of the

Ultimate Reality, in the form of a hypermatrix, is a great help to be able to bring about universe leaps. The reason is that the mental conception of the hypermatrix, with all that entails of abandoning other "primitive" representations, such as those of a material universe, an almighty God, etc., is a powerful means of detachment from the present universe. And, you will have understood, it is this detachment which is, above all, the condition for the universe change. This new vision of a universes hypermatrix full of potential is what this book aims to bring to you.

Have a nice trip in the informational hypermatrix!

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GLOSSARY OF SANSKRIT TERMS USED

Alayavijñāna: the "fundamental consciousness," concept taught by the Cittamātra school.

Avalokiteśvara: he is one of the greatest Bodhisattvas of Mādhyamika Buddhism.

Bhagavadgītā: this is the central part of the epic poem the Mahâbhârata, representing an abbreviation of the Vedic doctrine.

Bodhisattva: designates the one who has formed the vow to follow the path indicated by the Buddha.

Brahmājālasūtta: is a text attributed to Buddha, which exposes misconceptions in metaphysics and philosophy (Brahman's Net).

Cittamātra: is one of the names of the Yogācāra school of Buddhism.

Dharmadhatu: means Ultimate Reality or emptiness of emptiness.

Dukkha: is absolute suffering according to Buddhist teachings, in the sense that this suffering is not only relative to the conditioned phenomena that assail us, but appears permanently, even in pleasure and happiness.

Mādhyamaka: or "Middle Way," is one of the two main specific schools of Mahāyāna Buddhism, alongside the Cittamātra school.

Mādhyamika: is the adjective that corresponds to Mādhyamaka.

Mahāyāna: refers to Mahāyāna Buddhism, meaning "Great vehicle," teaching the doctrine of emptiness (the Prajñāpāramitā).

Māra: is the spirit (it is a metaphor) which strove, thanks to its army of temptations, to prevent the Buddha from attaining Enlightenment.

Nāgārjuna: is an Indian Buddhist monk, philosopher and writer of the 2nd and 3rd centuries.

Nirvāna: means Awakening for the Buddhist teaching or extinction of the ego. It can also be defined as a perfect detachment from the phenomenal world.

Prajñāpāramitā: a set of texts from Buddhism Mahāyāna concerning transcendental wisdom and emptiness.

Rājagriha: place where stood the Buddha, Avalokiteśvara, Śāriputra and their disciples, on the Vulture Peak, at the time of the exposition of the Prajñāpāramitā, in particular of the Heart Sūtra.

Samsāra: for Buddhism, it is the co-produced and conditioned, illusory world, under the influence of absolute suffering (dukkha), in which consciousness turns from existence to existence.

Śāriputra: one of the main disciples of the Buddha.

Sautrāntika: one of the schools of Hinayana Buddhism (small vehicle), which defends the conception that only indivisible atoms and instants of consciousness exist.

Śūnyatā: means in Buddhism the emptiness of all things, of the phenomenal universe.

Śūnyatiśūnya: means the emptiness of emptiness (vacuum of vacuum, nothing of nothing), once one has understood the emptiness of both phenomena and the ego (consciousness).

Sūtra: a sacred text, especially of Buddhism.

Tathāgata: one of the adjectives designating the Buddha, "the one who has gone," who has let go, who has awakened.

Tathāta: is "suchness," the dual nature of Ultimate Reality, both phenomena and emptiness.

Vaibhāshika: is one of the great Buddhist schools, which develops a realistic approach.

Vijñānavāda: is one of the names of the Yogācāra school of Buddhism.

Yogācāra: is one of the schools of Mahāyāna Buddhism, it teaches an idealism.

ABOUT THE AUTHOR

Writer, translator and independent editor, formerly clinical psychologist, doctor in psychopathology, Éric Loonis has published books on psychology, philosophy, spirituality-fiction, and handbooks. He translated H. G. Wells and Ernst Mach. Éric Loonis is also the author of a first French novel “L’enfant de la déesse,” in two volumes, and a first collection of short stories “Frida.”

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ENDNOTES

[1] Prajñāpāramitā, Bhagavadgītā, Brahmājālasūtta, tantra Kulayarāja, Sūtra Avatamsaka, Sūtra Gandavyūha.

[2] From the Greek οντος (*ontos*, the Being).

[3] We will soon see that this idea of "creating" universes is a provisional approximation. In fact, all universes are "already" there in a hypermatrix, the cat is alive in some universes, dead in others.

[4] Like Alain Connes (French mathematician, holder of the Fields Medal), David J. Chalmers (Australian philosopher), Frederick W. Kantor (physicist from Columbia University), Christopher Fuchs (physicist), John A. Wheeler (theoretical physicist), Jeffrey Bub (physicist), Alexei Grinbaum (philosopher of sciences), Lucien Hardy (physicist), Max Tegmark (physicist, cosmologist, and machine learning researcher)…

[5] For Wheeler, the first physics is that of movement, without explanation of movement (Galileo and Kepler); the second physics is that of the law, without explanation of the law (Newton, Maxwell, Einstein, string theory, etc.); the third physics is based on information (which should give the explanation of motion and law).

[6] Of course, the ontonomical model will not forget the second pillar of modern physics, the theory of general relativity, when the correspondences between ontonomical information and the phenomenal universe will be discussed.

[7] The term "ontonomy" is used in a certain number of fields of the human sciences, such as philosophy (Raimon Panikkar), in anthropology or ethnology (Louis Dumont). In this present work, it is a question of a metaphysical ontonomy.

[8] In this book we use the term "phenomenal" (adjective or noun) to refer to the universe as matter and energy, deployed in time and space, as we (human beings) experience it. To be

distinguished from the "phenomenal" in phenomenology, which expressly refers to a philosophical thinking.

[9] Kantor, F. W. (1977). *Information Mechanics*. New York, NY: John Wiley & Sons.

[10] Wheeler, J. A. (1990). Information, physics, quantum: The search for links. In W. Zurek (ed.), *Complexity, Entropy, and the Physics of Information*. Redwood City, CA: Addison-Wesley.

[11] Chalmers, D. J. (1995). Facing up to the Hard Problem of Consciousness. *Journal of Consciousness Studies*, 2(3), 200-219.

[12] Note in passing (we will come back to this), that if we apply the classic formula for calculating speed: Speed = Distance traveled divided by the Time of this journey (for example: 15 Km traveled in 20 minutes gives a speed of 15/20, i.e. 0.75 km per minute, i.e., multiplying by 60, 45 km/h), for the Planck length and time, this gives 10^{-35} m/10^{-44} s, i.e. approximately 300,000 Km/s, or *c*, the speed of light. If you want to check in a spreadsheet, use the exact values of the Planck units: 1.61625E-35 m and 5.39121E-44 s.

[13] Jacob D. Bekenstein (physicist, he works on the thermodynamics of black holes), Stephen Hawking (famous theoretical physicist and cosmologist), Gerard 't Hooft (physicist, Nobel Prize), Leonard Susskind (physicist, string theorist)…

[14] See their seminal work: Shannon, C. E., Weaver, W. (1949). *The mathematical theory of communication*. Urbana-Champaign: University of Illinois Press.

[15] Of course, "1" and "0" are binary symbols here. We do not know what the information of the informational matrix really consists of or how it is made up of. Being beyond phenomena and mental representations, it is likely that we will never know what it really is and that we are confined to simply using approximate symbols to get an idea of it: "1"

and "0"… Tegmark's hypothesis of a mathematical substrate at the base of the universe is interesting here.

[16] Nāgārjuna was an Indian Buddhist monk, philosopher and writer of the 2nd and 3rd centuries.

[17] "Mādhyamaka" is the substantive, the noun, when we say "the Mādhyamaka;" while Mādhyamika (we put a capital letter out of reverence) is the adjective, when we say, for example, "the Mādhyamika school."

[18] Aristotle (384-322 BC) was a Greek philosopher, who developed the study of absolute Being (metaphysics, ontology, the science of being as Being) and who had a profound influence on all Western and Eastern philosophy.

[19] Known as "Young's Double Slit Experiment."

[20] In such experiments, it is actually single photons that pass one by one. Such experiments could be reproduced with other types of particles and even with atoms or large molecules of several tens of atoms. While the pattern of interference fringes can be calculated with quantum mechanical equations, it is not possible to predict the exact path of each particle.

[21] Paul Dirac was a physicist and mathematician, he was one of the founders of quantum mechanics and shared with Erwin Schrödinger the Nobel Prize in Physics for major advances in the development of atomic theory.

[22] With a diameter of 3,474 km and evolving at an average distance of 384,400 km from the Earth, the formation of our natural satellite is the subject of scientific debate. The current hypothesis is that of a collision between the Earth and a celestial body of a size comparable to the planet Mars, at the very beginning of the formation of the solar system. This impact would have caused an ejection of material around the Earth, material which would then have condensed into a homogeneous body, the Moon.

[23] In 7 to 8 billion years, our Sun will become a red giant whose size will exceed the orbit of Venus. In this case, one hypothesis proposes that the solar gas emanating from the red giant slows the orbital speed of the Moon, which would bring it closer to Earth, until it reaches the "roche limit," which will cause its bursting into a ring of debris, which will then bombard our planet.

[24] In psychology and neurobiology, we differentiate sensation from perception. They are in fact the two stages of the same process of apprehension of the world. Sensation concerns the sense organs (vision, hearing, smell, taste, touch and cenesthesia) and the neurosensory processes that take place from sensory receptors that are activated by environmental (or internal, in the case of cenesthesia) and which send sensory messages to the central nervous system, the brain. Perception is a process that takes place in the brain and, from sensory input (sensation), develops interpretive awareness and meaning, information, about the environment (or the body itself).

[25] Of course, in this exercise in imagination we leave aside the major consequence of all these "losses" at birth: no human being worthy of the name could ever develop and live without his brain receiving any message, without that his consciousness is nourished by sensations, perceptions, stimulations. We therefore pretend to forget this improbability in order to be able to achieve the reduction to emptiness.

[26] Where we see that being "in a state of meditation" does not mean being in a coma! You can ask a question to a person in meditation, even deep meditation, he will answer you, if it seems appropriate to him, of course.

[27] A Bodhisattva is one who has made a commitment to follow the path of the Buddha and, while progressing on this path himself, to help others to do the same.

[28] Nirvāna is the enlightened state of one who has intuitively understood all emptiness and the emptiness of emptiness itself; while Samsāra is the dualistic state of illusion of one who believes in the external world, in the reality of phenomena and of the ego and who is fascinated by his emotions and desires.

[29] *Jetsün-Kahbum (Vie de Jetsün Milarepa)* (1975). Translated from Tibetan by Lama Kazi Dawa-Samdup. Paris: Librairie d'Amérique et d'Orient, Adrien Maisonneuve.

[30] *Bhagavad Gîtâ (La –)* (1976). Translated from Sanskrit by A.-M. Esnoul and O. Lacombe. Paris: Seuil-Sagesses.

[31] For some religious groups, this text could be 5000 years old.

[32] See his book released in 1973: *Cutting Through Spiritual Materialism* (Shambala Publications, Berkeley).

[33] A metaphor is a figure of speech which substitutes, by analogy, one term for another (for example, "a white coat covered the countryside" when speaking of "snow"). A metonymy is also a figure of language which substitutes, by logical contiguity (for example, by replacing the container by the content, one can say "the room applauds" when speaking of "people in the room").

[34] The speed of light is 299,792.458 kilometers per second.

[35] Wolfgang Pauli was a physicist, Nobel Prize in Physics for his work on the exclusion principle in quantum mechanics (two electrons of the same atom cannot be in the same quantum state).

[36] Carl Gustav Jung was a doctor, psychiatrist, psychologist and psychoanalyst for a time.

[37] Erwin Schrödinger was a physicist and theoretician, Nobel Prize in Physics (with Paul Dirac) for his work on the wave function associated with a particle in quantum mechanics.

[38] Eugene Wigner was a theoretical physicist, he shared a Nobel Prize in physics with other researchers for work, in

particular, on the quantum mechanics of the proton and the neutron.

[39] Aspect, A., Grangier, P., Roger, G. (1982). Experimental Realization of Einstein-Podolsky-Rosen-Bohm Gedanken experiment: A New Violation of Bell's Inequalities. *Physical Review Letters*, 49(2), 91-94.

[40] Alain Aspect is a physicist, known for having conducted the first test of the Einstein-Podolsky-Rosen paradox. He won the Wolf Prize for Physics in 2010 for his conceptual and experimental contributions to quantum physics and the Albert-Einstein Medal in 2012. He is theoretically eligible for the Nobel Prize.

[41] Just a small note for the attentive reader who would imagine that we could thus send messages from the Earth to the Moon (or further still) instantaneously, that is to say faster than the speed of the light, which would go against the theory of special relativity. In fact, entanglement phenomena only concern the **random** quantum states of objects. These states are therefore not (currently) manipulable by humans. So we have a random on Earth and the same random on the Moon, so no information is transmitted.

[42] Scully, M. O., Drühl, K. (1982). Quantum eraser: A proposed photon correlation experiment concerning observation and "delayed choice" in quantum mechanics. *Physical Review*, 25(4), 2208-2213.

[43] Ferrari, C., Braunecker, B. (2010). Entanglement, which-way measurements, and a quantum erasure. *American Journal of Physics*, 78(8), 792-795.

[44] In the EPR-Aspect experiment, the angle was 180°, but the principle of entanglement is the same.

[45] In practice, this experiment would be extremely difficult to carry out, because of the accuracy of the aiming of the *D1* detectors on the Moon and worse, *D2* on a satellite, not to mention the multiple disturbances that our atom would

encounter on its Earth-Moon path. In reality, quite concrete quantum eraser experiments have been carried out over distances of several tens of meters, in laboratories well protected from external disturbances. And it works!

[46] Wheeler, J. A. (1978). The "Past" and the "Delayed-Choice Double-Slit Experiment". In A. R. Marlow (ed.), *Mathematical Foundations of Quantum Theory*. New York: Academic Press, 9-48.

[47] Kim, Y.-H., Yu, R., Kulik, S. P., Shih, Y. H., Scully, M. (2000). A Delayed Choice Quantum Eraser. *Physical Review Letters*, 84(1), 1-5.

[48] For *c* the speed of light equal to 299 792 458 m/s, we have on the right $1/c$ = 0.000 000 003 seconds (i.e. 3 nanoseconds) and on the left $1000/c$ = 0.000 003 336 seconds (i.e. 3.33 microseconds).

[49] Note that this is a simple familiar image to help you picture this unique "block" formed by two entangled particles-waves. In reality, the movement of the end of a rule towards the other end cannot be instantaneous, as for entangled photons. This movement is transmitted at the maximum at the speed of light. For a ruler one kilometer long, it will take 3.33 microseconds (depending on the stiffness of the ruler) for it to flip over at the other end.

[50] Kaiser, F., Coudreau, Th., Milman, P., Ostrowsky, D. B., Tanzilli, S. (2012). Entanglement-enabled delayed choice experiment. *arXiv*:1206.4348v1 [quant-ph] 19 Jun 2012.

[51] https://youtu.be/oSCX78-8-q0

[52] Casimir, H. B. G. (1948). On the attraction between two perfectly conducting plates. *Proc. Kon. Nederland. Akad. Wetensch.*, B51, 793.

[53] On the diagram (Fig. 20) we have represented the universe with an image of the entire universe 380,000 years after the Big Bang. Image taken by the "Planck" satellite in 2013.

[54] Niels Bohr (quantum mechanical physicist, Nobel Prize in Physics), Werner Heisenberg (quantum mechanical physicist, Nobel Prize in Physics), Pascual Jordan (quantum mechanics theoretical physicist), Max Born (quantum mechanics physicist, Nobel Prize in Physics).

[55] David Bohm (theoretical physicist, who worked on quantum physics, philosophy and neuropsychology), Louis V. de Broglie (mathematician and physicist, Nobel Prize in physics for the discovery of the wave nature of electrons), Basil J. Hiley (quantum mechanics physicist), John S. Bell (physicist, Hughes Medal).

[56] Bohm, D., Hiley, B. J. (1995). *The Undivided Universe: An Ontological Interpretation of Quantum Theory*. New York: Routledge.

[57] Kocsis, S., Braverman, B., Ravets, S., Stevens, M. J., Mirin, R. P., Krister Shalm, L., Steinberg, A.M. (2001). Observing the Average Trajectories of Single Photons in a Two-Slit Interferometer. *Science*, 332, 1170-1173.

[58] Hugh Everett is a physicist and mathematician.

[59] David Deutsch is a physicist, specializing in quantum computing.

[60] Saunders, S., Barrett, J., Kent, A., Wallace, D. (eds.) (2010). *Many Worlds?: Everett, Quantum Theory, & Reality*. Oxford (UK): Oxford University Press.

[61] Heinlein, R. (1941). *And he built a crooked house*. Street and Smith Publications (Astounding Science Fiction), 1968.

[62] Illustrations and explanations can be found on the Wikipedia page: *https://bit.ly/3A9zPy3*.

[63] Gamow, G. (1961). *One Two Three … Infinity: Facts and Speculations of Science*. The Viking Press – New York, 2nd edition, p. 17.

[64] Fractals are objects whose structure does not vary, regardless of the change in scale.

[65] David Deutsch (physicist, Paul Dirac Prize), John Archibald Wheeler (theoretical physicist, Enrico Fermi Prize, Albert-Einstein Medal), Bryce Seligman DeWitt (theoretical physicist).

[66] Susskind, L. (2005). *The cosmic landscape: string theory and the illusion of intelligent design*. Little: Brown and Company.

[67] D-branes stands for Dirichlet branes (from Johan Dirichlet, mathematician), which corresponds to the fact that the strings cannot come out of the brane.

[68] Roveli, C. (2012). *Et si le temps n'existait pas ? Un peu de science subversive* [What if time didn't exist? A bit of subversive science]. Paris : Dunod.

[69] All of these researchers are theoretical physicists.

[70] Osto, D. (2009). The Supreme Array Scripture: A New Interpretation of the Title "Gandavyūha-sūtra." *Journal of Indian Philosophy*, 37(3), 273-290.

[71] Suzuki, D. T. (2003). *Essais sur le bouddhisme Zen* [Essays on Zen Buddhism] - Séries I, II, III. Paris : Albin Michel.

[72] Translated by the author.

[73] By David Parrott, Creative Commons licence, 2009 (*https://bit.ly/3dMRtAc*).

[74] Leibniz, G. W. (1714). *Leibniz: The Monadology And Other Philosophical Writings*. Franklin Classics Trade Press, 2018.

[75] As a reminder, fermions relate to particles of matter (electrons, nucleons), while bosons relate to force-supporting particles, also called "virtual," such as photons, gluons, bosons.

[76] {1} and {0} are read "capsulated one" and "capsulated zero" respectively, and the same is true for any other value (e.g. {800} "capsulated eight hundred").

[77] At the risk of complicating things a little, we should distinguish between being (onton) absolute and relative, just as between nothingness (nihil) absolute and relative. But the

reader will understand that the "absolute" means, on the one hand, the theoretical conception of being in its origin and, on the other hand, the "nothing of nothing" in the matter of nothingness (nihil). Whereas from the moment one conceives, side by side, being and nothingness, both lose their absoluteness, they become "relative" to each other.

[78] By convention, the terms "onton" and "nihil" refer both to absolute being or absolute nothingness, as general concepts, and to the designation of informational units of relative being and nothingness ({1} and {0}). In one case, the singular is used, in the other the plural can be applied for pluralities of ontonomical units (several ontons, several nihils).

[79] We will usefully recall here that, at the risk of an FOE, this inclusion, this potential, in the onton, should not be seen as a kind of material compression nor the stages of the deployment of the onton as succeeding each other in time. At our ontonomical level of analysis, neither space, nor time, nor matter, nor energy do not yet exist (the "not yet" does not refer here either to a notion of time or succession, etc.). We must therefore not confuse the sequences of a conceptualization that borrows from the temporal metaphor, with a true temporal succession. **Once again: the onton, the ontonomical information, is not in a time nor in a space.**

[80] Terminological clarification: the epithet "ontonomical" is used to qualify the model and its relationships with other theories (ontonomical model, approach, point of view, etc.); while "ontonomical" is also used to qualify, in the ontonomical model, the informational structure (information, unfolding, wave, length, fusion, defusion, matrix, etc., ontonomical).

[81] The representation of this unfolding of the onton as a "string" can be at the origin of a new FOE: considering the string as a (quasi) material object, in a kind of space, which would also suggest a temporality. In fact, ontonomically speaking, the string is only a convention of representation. It

symbolizes a logic of deployment, the idea of a linear succession and not of a heap.

[82] On this last point, the questions of probability/improbability founding the information, for the moment not relevant at the level of the absolute onton, will reappear when we consider the ontonomical deployment further.

[83] Shannon, C. E. (1948). A mathematical theory of communication. *Bell System Technical Journal*, 27, 379-423 and 623-656.

[84] Shannon, C. E., Weaver, W. (1949). *The mathematical theory of communication*. Urbana-Champaign: University of Illinois Press.

[85] Of course, the terms "high," "low," "rising," and "descending," are conventions of symbolic representation and have nothing to do with a spatiality which does not exist within the framework of the matrix.

[86] See Wikipedia: *https://bit.ly/3TaISaG*.

[87] Here, the terms "local universe" means a universe that extends over approximately 13.7 billion light-years, according to the current standard cosmological model of the Big Bang.

[88] The term "initially" is, of course, figurative. It does not concern a genesis of the onton, as if it were inscribed in a temporality because, we have made it clear, the onton is not inscribed in a temporality, since it is it which creates time (or rather it is the successive "reading" of the layers of ontonomic matrix that forms phenomenological temporality). "Initially" therefore means at the beginning of our description of the onton, just as one would say, to describe a tree, "initially, we see the trunk rising, then the branches emerge, more and more numerous, etc."

[89] However, given the Planck length, let's not forget that a particle-wave like the proton is "defined" by one hundred

billion billion ontons and nihils, “bits,” organized into information.

[90] *https://bit.ly/3KllIKw*, the link where you will find a colored high definition version (5.332 × 5.401 pixels, 5.73 MB) of this image.

[91] Translated by the author.

[92] It is estimated that for a given galaxy, one to four supernovae explode every thousand years and for the entire universe (observable universe), ten supernovae explode every second.

[93] The reader can tell himself now that, to contradict the matrix, he will change the “past of the future” and, using his (illusory) free will, not return home. This poses, in fact, no difficulty from the point of view of the model of the informationnal matrix: “he does not go home?” This is what is also written in the matrix!

[94] The use of a video image sent by a radio signal is strictly equivalent to the use of super overpowered imaginary telescopes capable of seeing details as tenuous as a person closing the door of his house. Both are electromagnetic signals that travel between the two planets at the speed of light. If the experiment with telescopes poses an obvious problem of feasibility, that with video cameras is quite feasible.

[95] We will not take into account the fact that, according to the theory of relativity, time does not flow at the same speed between Earth and Mars. The time lag is completely negligible in the context of this experiment, which lasts half an hour, between two spatially close planets.

[96] We have chosen to capitalize it because it represents all the consciousnesses of the universe.

[97] This nesting of consciousnesses has no relation to the solipsistic nesting of transcendental egos, although there is a slight analogy there.

[98] From *Ishvara*, which can be translated as cosmic consciousness according to Hindu or Buddhist traditions.

[99] We also speak of the "Noble duplicity."

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From the most profound Buddhist teachings to the results and speculations of modern physical science, all agree on the model of a universe underpinned by a quantum weave, immersed in a multiverse. The purpose of this work of spirituality-fiction is to explain how it is possible, not to change the universe in which we live, but how it would be possible to universe leap, to simply pass into a more or less parallel universe, in order to live something other than what we are currently living. For this, the work exposes, on the one hand, the Buddhist teachings of the Mādhyamika school and the philosopher Nagarjuna and, on the other hand, the works in quantum mechanics, this in order to understand the following: the definition of an informational matrix (already perceived by Buddhism with the "Vairocana Tower" and the "Indra's net") and its multidimensional dimension (Hilbert's space) which opens us to this idea of multiverse. From there, the question of the "playing" and the "player" of this matrix is asked, opening the field to this fantastic hypothesis of a leap from our universe to another universe. Meditative Buddhist methods are offered to attempt this fabulous journey into the informational matrix. It's up to you to try!

Universe leap into the multiverse, Buddhism and science help us to imagine it and, perhaps, to try it...

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